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NEWS	1		Web Page for STN Seminar Schedule - N. America
NEWS	2	DEC 01	ChemPort single article sales feature unavailable
NEWS	3	FEB 02	Simultaneous left and right truncation (SLART) added for CERAB, COMPUAB, ELCOM, and SOLIDSTATE
NEWS	4	FEB 02	GENBANK enhanced with SET PLURALS and SET SPELLING
NEWS	5	FEB 06	Patent sequence location (PSL) data added to USGENE
NEWS	6	FEB 10	COMPENDEX reloaded and enhanced
NEWS	7	FEB 11	WTEXTILES reloaded and enhanced
NEWS	8	FEB 19	New patent-examiner citations in 300,000 CA/CAPLUS patent records provide insights into related prior art
NEWS	9	FEB 19	Increase the precision of your patent queries -- use terms from the IPC Thesaurus, Version 2009.01
NEWS	10	FEB 23	Several formats for image display and print options discontinued in USPATFULL and USPAT2
NEWS	11	FEB 23	MEDLINE now offers more precise author group fields and 2009 MeSH terms
NEWS	12	FEB 23	TOXCENTER updates mirror those of MEDLINE - more precise author group fields and 2009 MeSH terms
NEWS	13	FEB 23	Three million new patent records blast AEROSPACE into STN patent clusters
NEWS	14	FEB 25	USGENE enhanced with patent family and legal status display data from INPADOCDB
NEWS	15	MAR 06	INPADOCDB and INPAFAMDB enhanced with new display formats
NEWS	16	MAR 11	EPFULL backfile enhanced with additional full-text applications and grants
NEWS	17	MAR 11	ESBIOBASE reloaded and enhanced
NEWS	18	MAR 20	CAS databases on STN enhanced with new super role for nanomaterial substances
NEWS	19	MAR 23	CA/CAPLUS enhanced with more than 250,000 patent equivalents from China
NEWS	20	MAR 30	IMSPATENTS reloaded and enhanced
NEWS	21	APR 03	CAS coverage of exemplified prophetic substances enhanced
NEWS	22	APR 07	STN is raising the limits on saved answers
NEWS	23	APR 24	CA/CAPLUS now has more comprehensive patent assignee information
NEWS	24	APR 26	USPATFULL and USPAT2 enhanced with patent assignment/reassignment information
NEWS	25	APR 28	CAS patent authority coverage expanded
NEWS	26	APR 28	ENCOMPLIT/ENCOMPLIT2 search fields enhanced
NEWS	27	APR 28	Limits doubled for structure searching in CAS REGISTRY
NEWS	28	MAY 08	STN Express, Version 8.4, now available
NEWS	29	MAY 11	STN on the Web enhanced

NEWS 30 MAY 11 BEILSTEIN substance information now available on  
STN Easy  
NEWS 31 MAY 14 DGENE, PCTGEN and USGENE enhanced with increased  
limits for exact sequence match searches and  
introduction of free HIT display format  
NEWS 32 MAY 15 INPADOCDB and INPAFAMDB enhanced with Chinese legal  
status data

NEWS EXPRESS JUNE 27 08 CURRENT WINDOWS VERSION IS V8.3,  
AND CURRENT DISCOVER FILE IS DATED 06 APRIL 2009.

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FILE 'HOME' ENTERED AT 14:10:29 ON 21 MAY 2009

=> file caplus		
COST IN U.S. DOLLARS	SINCE FILE	TOTAL
	ENTRY	SESSION
FULL ESTIMATED COST	0.66	0.66

FILE 'CAPLUS' ENTERED AT 14:12:20 ON 21 MAY 2009  
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FILE COVERS 1907 - 21 May 2009 VOL 150 ISS 21  
FILE LAST UPDATED: 20 May 2009 (20090520/ED)  
REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2009  
USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2009

CAPLUS now includes complete International Patent Classification (IPC)  
reclassification data for the third quarter of 2008.

CAS Information Use Policies apply and are available at:

<http://www.cas.org/legal/infopolicy.html>

This file contains CAS Registry Numbers for easy and accurate

```
=> e us20070039665/pn
E1      1      US20070039661/PN
E2      1      US20070039662/PN
E3      1  --> US20070039665/PN
E4      1      US20070039666/PN
E5      1      US20070039667/PN
E6      1      US20070039668/PN
E7      1      US20070039669/PN
E8      1      US20070039670/PN
E9      1      US20070039671/PN
E10     1      US20070039672/PN
E11     1      US20070039674/PN
E12     1      US20070039675/PN
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=> s e3;d all
L1      1      US20070039665/PN
```

```
L1  ANSWER 1 OF 1  CAPLUS  COPYRIGHT 2009 ACS on STN
AN  2004:847649  CAPLUS
DN  141:353637
ED  Entered STN:  15 Oct 2004
TI  Pretreatment of Ag-alloy surface with organosulfur compounds for
tarnishing prevention
IN  Johns, Peter Gammon; Harrison, Clare Elizabeth
PA  Middlesex Silver Co. Limited, UK
SO  PCT Int. Appl., 43 pp.
CODEN: PIXXD2
DT  Patent
LA  English
IC  ICM C23F011-16
CC  56-6 (Nonferrous Metals and Alloys)
FAN.CNT 1
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	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004087996	A1	20041014	WO 2004-GB1373	20040330
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2004225693	A1	20041014	AU 2004-225693	20040330
	CA 2520807	A1	20041014	CA 2004-2520807	20040330
	EP 1611267	A1	20060104	EP 2004-724313	20040330
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK				
	CN 1780937	A	20060531	CN 2004-80011375	20040330
	JP 2006523266	T	20061012	JP 2006-506057	20040330
	IN 2005DN04346	A	20070831	IN 2005-DN4346	20050926
	MX 2005010452	A	20060510	MX 2005-10452	20050928
	US 20070039665	A1	20070222	US 2005-551476	20050929 <--
FRAI	GB 2003-7290	A	20030331		
	WO 2004-GB1373	W	20040330		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2004087996	ICM	C23F011-16
	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
AU 2004225693	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
CA 2520807	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
EP 1611267	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
CN 1780937	IPCI	C23F0011-16 [I,A]; C23F0011-10 [I,C*]
	ECLA	C23F011/16; C23F011/16B
JP 2006523266	IPCI	C23F0011-00 [I,A]; C22C0005-06 [I,A]; C22C0005-08 [I,A]
	IPCR	C23F0011-00 [I,C]; C23F0011-00 [I,A]; C22C0005-06 [I,C]; C22C0005-06 [I,A]; C22C0005-08 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	FTERM	4K062/AA01; 4K062/BB21; 4K062/BC22; 4K062/FA16
IN 2005DN04346	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
MX 2005010452	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]
	ECLA	C23F011/16; C23F011/16B
US 20070039665	IPCI	C23G0001-00 [I,A]; C23C0022-58 [I,A]; C23C0022-05 [I,C*]
	NCL	148/271.000; 134/002.000

AB The Ag alloys containing minor Ge (especially Ag-Cu-Ge alloys) to decrease the fire

stain discoloration are pretreated on the surface with an alkanethiol, alkyl thioglycollate, dialkyl sulfide, or dialkyl disulfide to prevent tarnishing. The treatment with organosulfur compds. is suitable for manufactured Ag-alloy articles to prevent tarnished appearance during transit and the subsequent extended display without special packaging. The Ag-alloy surface is optionally treated with aqueous solution containing an alkanethiol, alkyl thioglycollate, dialkyl sulfide, or dialkyl disulfide, as well as a mixture of anionic surfactant and amphoteric or nonionic surfactant to solubilize the treatment agent. The typical ternary alloy contains Ag 80-96, Cu 1-19.9, and Ge 0.1-5%.

ST silver copper germanium alloy tarnishing prevention organosulfur

IT Surfactants

(anionic, in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Surfactants

(in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Surfactants

(nonionic, in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Tarnishing

(prevention of; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Thioethers

Thiols, uses

RL: TEM (Technical or engineered material use); USES (Uses)

(tarnishing prevention by; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 7440-56-4, Germanium, uses

RL: MOA (Modifier or additive use); USES (Uses)

(Ag alloys containing, tarnishing prevention on; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 106-94-5, n-Propyl bromide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (solvent, in tarnishing prevention; Ag-alloy surface treated with  
 organosulfur compds. for tarnishing prevention)

IT 2885-00-9, Octadecyl mercaptan 2917-26-2, Cetyl mercaptan  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (tarnishing prevention by; Ag-alloy surface treated with organosulfur  
 compds. for tarnishing prevention)

IT 39282-03-6, Sterling silver 103221-24-5 476614-10-5 476614-12-7  
 476614-13-8  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (tarnishing prevention on; Ag-alloy surface treated with organosulfur  
 compds. for tarnishing prevention)

IT 9080-17-5, Ammonium polysulfide  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); PROC (Process)  
 (test solution with, for tarnishing; Ag-alloy surface treated with  
 organosulfur compds. for tarnishing prevention)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

- (1) Carlton, C; US 3503883 A 1970
- (2) Carpenter, J; US 3398003 A 1968 CAPLUS
- (3) Gamon, J; EP 0729398 A 1996 CAPLUS
- (4) Gamon, J; WO 02095082 A 2002 CAPLUS
- (5) Goddard & Sons Ltd J; GB 1070384 A 1967 CAPLUS
- (6) Goddard & Sons Ltd J; GB 1130540 A 1968
- (7) Han, S; JOURNAL OF THE AMERICAN CHEMICAL SOCIETY 2001, V123, P2422 CAPLUS
- (8) Metaleurop Rech; GB 2255348 A 1992 CAPLUS
- (9) Nippon Germanium Lab Co Ltd; EP 1130124 A 2001 CAPLUS

=> file reg;s 106-94-5/rn;d;s 2885-00-9/rn;d;s 2917-26-2/rn;d

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	9.12	9.78
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CA SUBSCRIBER PRICE	-0.82	-0.82

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STRUCTURE FILE UPDATES: 20 MAY 2009 HIGHEST RN 1147939-89-6  
 DICTIONARY FILE UPDATES: 20 MAY 2009 HIGHEST RN 1147939-89-6

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TSCA INFORMATION NOW CURRENT THROUGH January 9, 2009.

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REGISTRY includes numerically searchable data for experimental and  
 predicted properties as well as tags indicating availability of

experimental property data in the original document. For information on property searching in REGISTRY, refer to:

<http://www.cas.org/support/stngen/stdoc/properties.html>

L2 1 106-94-5/RN

L2 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN

RN 106-94-5 REGISTRY

ED Entered STN: 16 Nov 1984

CN Propane, 1-bromo- (CA INDEX NAME)

OTHER NAMES:

CN 1-Bromopropane

CN 1-Propyl bromide

CN Ascusol MC

CN Drysol

CN Leksol

CN n-Propyl bromide

CN Propyl bromide

MF C3 H7 Br

CI COM

LC STN Files: AGRICOLA, ANABSTR, AQUIRE, BEILSTEIN\*, BIOSIS, BIOTECHNO, CA, CAPLUS, CASREACT, CSNB, CHEMCATS, CHEMINFORMRX, CHEMLIST, CHEMSAFE, CIN, CSCHEM, CSNB, DETHERM\*, EMBASE, GMELIN\*, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA, MEDLINE, MRCK\*, MSDS-OHS, NAPRALERT, PIRA, PROMT, PS, RTECS\*, SPECINFO, SYNTHLINE, TOXCENTER, USPAT2, USPATFULL, USPATOLD  
(\*File contains numerically searchable property data)

Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)

Br-CH<sub>2</sub>-CH<sub>2</sub>-CH<sub>3</sub>

\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

4951 REFERENCES IN FILE CA (1907 TO DATE)

50 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

4963 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L3 1 2885-00-9/RN

L3 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN

RN 2885-00-9 REGISTRY

ED Entered STN: 16 Nov 1984

CN 1-Octadecanethiol (CA INDEX NAME)

OTHER NAMES:

CN 1-Mercaptooctadecane

CN 1-Octadecyl mercaptan

CN n-Octadecanethiol

CN n-Octadecyl mercaptan

CN NSC 5545

CN Octadecanethiol

CN Octadecyl mercaptan

CN Octadecylthiol  
CN Stearyl mercaptan  
MF C18 H38 S  
CI COM  
LC STN Files: AGRICOLA, ANABSTR, BEILSTEIN\*, BIOSIS, CA, CAPLUS, CASREACT,  
CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHM, DETHERM\*, IFICDB, IFIPAT,  
IFIUDB, MEDLINE, MSDS-OHS, PIRA, PROMT, SPECINFO, TOXCENTER, USPAT2,  
USPATFULL, USPATOLD  
(\*File contains numerically searchable property data)  
Other Sources: EINECS\*\*, NDSL\*\*, TSCA\*\*  
(\*Enter CHEMLIST File for up-to-date regulatory information)

HS-(CH<sub>2</sub>)<sub>17</sub>-Me

\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

2003 REFERENCES IN FILE CA (1907 TO DATE)  
221 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
2011 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L4 1 2917-26-2/RN

L4 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN

RN 2917-26-2 REGISTRY

ED Entered STN: 16 Nov 1984

CN 1-Hexadecanethiol (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Hexadecanethiol (6CI)

OTHER NAMES:

CN 1-Mercaptohexadecane

CN Cetyl mercaptan

CN Hexadecyl mercaptan

CN Hexadecylthiol

CN n-Hexadecanethiol

CN n-Hexadecyl mercaptan

CN n-Hexadecylthiol

CN NSC 229611

CN NSC 57866

MF C16 H34 S

CI COM

LC STN Files: AGRICOLA, ANABSTR, BEILSTEIN\*, BIOSIS, CA, CAPLUS, CASREACT,  
CHEMCATS, CHEMINFORMRX, CHEMLIST, CIN, CSCHM, ENCOMPLIT, ENCOMPLIT2,  
ENCOMPAT, ENCOMPAT2, IFICDB, IFIPAT, IFIUDB, MEDLINE, PIRA, SPECINFO,  
SYNTHLINE, TOXCENTER, USPAT2, USPATFULL, USPATOLD

(\*File contains numerically searchable property data)

Other Sources: EINECS\*\*, NDSL\*\*, TSCA\*\*

(\*Enter CHEMLIST File for up-to-date regulatory information)

HS-(CH<sub>2</sub>)<sub>15</sub>-Me

\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

1614 REFERENCES IN FILE CA (1907 TO DATE)  
 179 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 1621 REFERENCES IN FILE CAPLUS (1907 TO DATE)

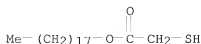
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=> e stearyl thioglycollate/cn
E1      1      STEARYL THIOCTATE/CN
E2      1      STEARYL THIOGLYCOLATE/CN
E3      0 --> STEARYL THIOGLYCOLATE/CN
E4      1      STEARYL TITANATE/CN
E5      1      STEARYL TOSYLATE/CN
E6      1      STEARYL TRIHYDROXY SILANE/CN
E7      1      STEARYL TRIHYDROXYETHYL PROPYLENEDIAMINE DIHYDROFLUORIDE/CN
E8      1      STEARYL UNDECENOATE/CN
E9      1      STEARYL UROCANATE/CN
E10     1      STEARYL URSOLATE/CN
E11     1      STEARYL VINYL ETHER/CN
E12     1      STEARYL VINYL ETHER HOMOPOLYMER/CN
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=> s e3;d
L5      0 "STEARYL THIOGLYCOLATE"/CN
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L5 HAS NO ANSWERS
L5      0 SEA FILE=REGISTRY "STEARYL THIOGLYCOLATE"/CN
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=> s e2;d
L6      1 "STEARYL THIOGLYCOLATE"/CN
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L6 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN
RN 10220-46-9 REGISTRY
ED Entered STN: 16 Nov 1984
CN Acetic acid, 2-mercapto-, octadecyl ester (CA INDEX NAME)
OTHER CA INDEX NAMES:
CN Acetic acid, mercapto-, octadecyl ester (7CI, 8CI, 9CI)
OTHER NAMES:
CN NSC 65478
CN Octadecyl mercaptoacetate
CN Octadecyl thioglycolate
CN Stearyl thioglycolate
CN Thioglycolate octadecyl ester
CN Thioglycolic acid octadecyl ester
MF C20 H40 O2 S
CI COM
LC STN Files: BIOSIS, CA, CAPLUS, CHEMCATS, CHEMLIST, CSCHEM, GMELIN*,
  IFICDB, IFIPAT, IFIUDB, MEDLINE, TOXCENTER, USPAT2, USPATFULL, USPATOLD
  (*File contains numerically searchable property data)
Other Sources: EINECS**, NDSL**, TSCA**
  (**Enter CHEMLIST File for up-to-date regulatory information)
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\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

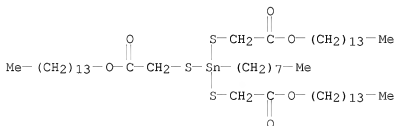


50 REFERENCES IN FILE CA (1907 TO DATE)  
 4 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 50 REFERENCES IN FILE CAPLUS (1907 TO DATE)

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 L7 15 THIOGLYCOLLATE

=> d 1-15

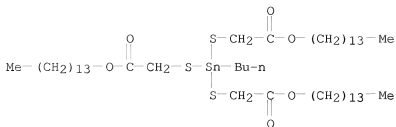
L7 ANSWER 1 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 74162-83-7 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN 8-Oxa-3,5-dithia-4-stannadocosanoic acid,  
 4-octyl-7-oxo-4-[[2-oxo-2-(tetradecyloxy)ethyl]thio]-, tetradecyl ester  
 (CA INDEX NAME)  
 OTHER NAMES:  
 CN Octyltin tris(tetradecathioglycollate)  
 MF C56 H110 O6 S3 Sn  
 LC STN Files: CA, CAPLUS, CHEMLIST, TOXCENTER, USPATFULL  
 Other Sources: EINECS\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

7 REFERENCES IN FILE CA (1907 TO DATE)  
 7 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 2 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 72259-65-5 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN 8-Oxa-3,5-dithia-4-stannadocosanoic acid,  
 4-butyl-7-oxo-4-[[2-oxo-2-(tetradecyloxy)ethyl]thio]-, tetradecyl ester  
 (CA INDEX NAME)  
 OTHER CA INDEX NAMES:  
 CN Acetic acid, 2,2',2''-[(butylstannylidyne)tris(thio)]tris-, tritetradecyl  
 ester (9CI)  
 OTHER NAMES:  
 CN Butyltin tris(tetradecathioglycollate)  
 MF C52 H102 O6 S3 Sn  
 LC STN Files: CA, CAPLUS, CHEMLIST, TOXCENTER, USPATFULL  
 Other Sources: EINECS\*\*, NDSL\*\*, TSCA\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)

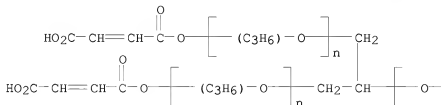


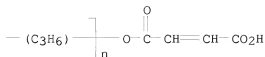
\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

7 REFERENCES IN FILE CA (1907 TO DATE)  
7 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 3 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
RN 55400-47-0 REGISTRY  
ED Entered STN: 16 Nov 1984  
CN Acetic acid, mercapto-, 2-ethyl-2-[(mercaptoacetyl)oxy]-1,3-propanediyl ester, polymer with (all-Z)- $\alpha,\alpha',\alpha''$ -1,2,3-propanetriyltris[ $\theta$ -[(3-carboxy-1-oxo-2-propenyl)oxy]poly[oxy(methyl-1,2-ethanediyl)]] (9CI) (CA INDEX NAME)  
OTHER CA INDEX NAMES:  
CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha,\alpha',\alpha''$ -1,2,3-propanetriyltris[ $\theta$ -[(3-carboxy-1-oxo-2-propenyl)oxy]-, (all-Z)-, polymer with 2-ethyl-2-[(mercaptoacetyl)oxy]-1,3-propanediyl bis(mercaptoacetate) (9CI)  
OTHER NAMES:  
CN Polypropylene glycol glycerol triether tris(hydrogen maleate)-1,1,1-trimethylolpropane trithioglycollate copolymer  
MF (C12 H20 O6 S3 . (C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C15 H14 O12)x  
CI PMS  
PCT Polyester, Polyether, Polythioester, Polythioester formed, Polythioether, Polythioether formed, Polyvinyl  
LC STN Files: CA, CAPLUS  
  
CM 1  
  
CRN 52297-16-2  
CMF (C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C15 H14 O12  
CCI IDS, PMS

PAGE 1-A

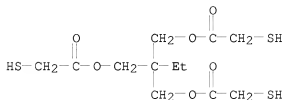




CM 2

CRN 10193-96-1

CMF C12 H20 O6 S3



1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 4 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN

RN 52486-43-8 REGISTRY

ED Entered STN: 16 Nov 1984

CN Acetic acid, mercapto-, 1,2,3-propanetriyl ester, polymer with  
(all-Z)- $\alpha,\alpha',\alpha''$ -1,2,3-propanetriyltris[ $\omega$ -[(3-carboxy-1-oxo-2-propenyl)oxy]-, (all-Z)-,  
carboxy-1-oxo-2-propenyl)oxy]poly[oxy(methyl-1,2-ethanediyl)] (9CI) (CA  
INDEX NAME)

OTHER CA INDEX NAMES:

CN Poly[oxy(methyl-1,2-ethanediyl)],  $\alpha,\alpha',\alpha''$ -1,2,3-  
propanetriyltris[ $\omega$ -[(3-carboxy-1-oxo-2-propenyl)oxy]-, (all-Z)-,  
polymer with 1,2,3-propanetriyl tris(mercaptoacetate) (9CI)

OTHER NAMES:

CN Glycerol tris(mercaptoacetate)- $\alpha,\alpha',\alpha''$ -1,2,3-  
propanetriyltris(polypropylene glycol) maleate (1:3) polymer  
CN Glycerol trithioglycollate-polypropylene glycol glycerol triether  
tris(hydrogen maleate) copolymer

MF (C9 H14 O6 S3 . (C3 H6 O)n (C3 H6 O)n C15 H14 O12)x

CI PMS

PCT Polyester, Polyether, Polythioester, Polythioester formed, Polythioether,  
Polythioether formed, Polyvinyl

LC STN Files: CA, CAPLUS

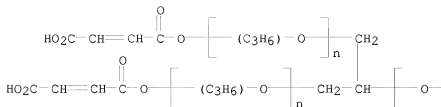
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CRN 52297-16-2

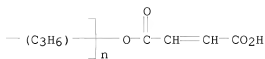
CMF (C3 H6 O)n (C3 H6 O)n (C3 H6 O)n C15 H14 O12

CCI IDS, PMS

PAGE 1-A



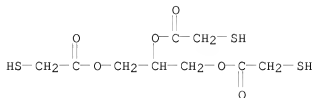
PAGE 1-B



CM 2

CRN 14974-53-9

CMF C9 H14 O6 S3



2 REFERENCES IN FILE CA (1907 TO DATE)

2 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 5 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN

RN 52080-69-0 REGISTRY

ED Entered STN: 16 Nov 1984

CN D-Valine, 3-mercapto-, mixt. with mercaptoacetic acid bismuth(3+) sodium salt (3:1:3) (9CI) (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Acetic acid, mercapto-, bismuth(3+) sodium salt (3:1:3), mixt. contg. (9CI)

OTHER NAMES:

CN d-Dimethylcysteine-sodium bismuth thioglycollate mixture

FS STEREOSEARCH

MF C5 H11 N O2 S . C2 H4 O2 S . 1/3 Bi . Na

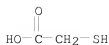
CI MXS

LC STN Files: CA, CAPLUS

CM 1

CRN 150-49-2 (68-11-1)

CMF C2 H4 O2 S . 1/3 Bi . Na



● 1/3 Bi(III)

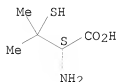
● Na

CM 2

CRN 52-67-5

CMF C5 H11 N O2 S

Absolute stereochemistry.



1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 6 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN

RN 42249-01-4 REGISTRY

ED Entered STN: 16 Nov 1984

CN Acetic acid, mercapto-, 1,4-butanediyl ester, homopolymer (9CI) (CA INDEX NAME)

OTHER NAMES:

CN 1,4-Butanediol bis(thioglycollate) polymer

MF (C8 H14 O4 S2)x

CI PMS

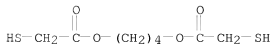
PCT Polyester, Polysulfide, Polysulfide formed, Polythioether, Polythioether formed

LC STN Files: CA, CAPLUS

CM 1

CRN 10193-95-0

CMF C8 H14 O4 S2



1 REFERENCES IN FILE CA (1907 TO DATE)

1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

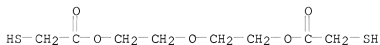
L7 ANSWER 7 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
RN 42249-00-3 REGISTRY  
ED Entered STN: 16 Nov 1984  
CN Acetic acid, mercapto-, oxydi-2,1-ethanediyl ester, homopolymer (9CI) (CA INDEX NAME)

OTHER NAMES:

CN Diethyleneglycolbis(thioglycollate)polymer  
MF (C8 H14 O5 S2)x  
CI PMS  
PCT Polyester, Polyether, Polysulfide, Polysulfide formed, Polythioether, Polythioether formed  
LC STN Files: CA, CAPLUS

CM 1

CRN 14974-52-8  
CMF C8 H14 O5 S2



1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

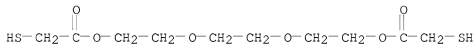
L7 ANSWER 8 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
RN 40544-92-1 REGISTRY  
ED Entered STN: 16 Nov 1984  
CN Acetic acid, mercapto-, 1,2-ethanediylbis(oxy-2,1-ethanediyl) ester, homopolymer (9CI) (CA INDEX NAME)

OTHER NAMES:

CN Triethylene glycol bis(thioglycollate) prepolymer  
CN Triethyleneglycolbisthioglycollate polymer  
MF (C10 H18 O6 S2)x  
CI PMS  
PCT Polyester, Polyether, Polysulfide, Polysulfide formed, Polythioether, Polythioether formed  
LC STN Files: CA, CAPLUS

CM 1

CRN 10193-94-9  
CMF C10 H18 O6 S2



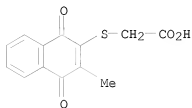
1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 9 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
RN 37019-53-7 REGISTRY  
ED Entered STN: 16 Nov 1984  
CN Acetic acid, 2-[(1,4-dihydro-3-methyl-1,4-dioxo-2-naphthalenyl)thio]-, sodium salt (1:1) (CA INDEX NAME)

OTHER CA INDEX NAME:

CN Acetic acid, [(1,4-dihydro-3-methyl-1,4-dioxo-2-naphthalenyl)thio]-,

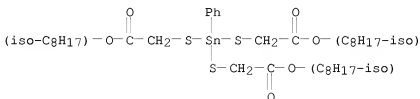
sodium salt (9CI)  
 OTHER NAMES:  
 CN 2-Methyl-1:4-naphthaquinone-3-thioglycollate sodium salt  
 MF C13 H10 O4 S . Na  
 LC STN Files: CA, CAPLUS  
 CRN (6325-58-2)



1 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

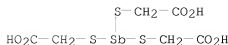
L7 ANSWER 10 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 36118-61-3 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Acetic acid, 2,2',2''-[(phenylstannylidyne)tris(thio)]tris-, triisooctyl ester (9CI) (CA INDEX NAME)

OTHER NAMES:  
 CN Monophenyltintris(isooctyl)thioglycollate  
 CN Phenyltin tris(isooctyl thioglycolate)  
 MF C36 H62 O6 S3 Sn  
 CI IDS  
 LC STN Files: CA, CAPLUS, IFICDB, IFIPAT, IFIUDB, USPATFULL, USPATOLD



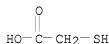
3 REFERENCES IN FILE CA (1907 TO DATE)  
 2 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 11 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 6780-12-7 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Acetic acid, mercapto-, triester with thioantimonic acid (H3SbS3), trisodium salt (8CI) (CA INDEX NAME)  
 OTHER NAMES:  
 CN Sodium antimonylthioglycollate  
 MF C6 H9 O6 S3 Sb . 3 Na  
 CRN (736072-12-1)



●3 Na

L7 ANSWER 12 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 5421-46-5 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Acetic acid, 2-mercapto-, ammonium salt (1:1) (CA INDEX NAME)  
 OTHER CA INDEX NAMES:  
 CN Acetic acid, mercapto-, monoammonium salt (8CI, 9CI)  
 OTHER NAMES:  
 CN Ammonium mercaptoacetate  
 CN Ammonium thioglycolate  
 CN Ammonium thioglycollate  
 CN Thiofaco A-50  
 CN Thioglycolic acid ammonium salt  
 DR 860540-22-3, 8046-21-7, 67124-12-3, 34316-71-7  
 MF C2 H4 O2 S . H3 N  
 CI COM  
 LC STN Files: AQUIRE, BIOSIS, CA, CAPLUS, CASREACT, CBNB, CHEMCATS,  
 CHEMLIST, CIN, CSCHM, CSNB, EMBASE, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA,  
 MSDS-OHS, PROMT, RTECS\*, TOXCENTER, ULIDAT, USPAT2, USPATFULL, USPATOLD  
 (\*File contains numerically searchable property data)  
 Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
 (\*\*Entered CHEMLIST File for up-to-date regulatory information)  
 CRN (68-11-1)



● NH3

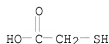
\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

542 REFERENCES IN FILE CA (1907 TO DATE)  
 3 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 542 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 13 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 814-71-1 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Acetic acid, 2-mercapto-, calcium salt (2:1) (CA INDEX NAME)  
 OTHER CA INDEX NAMES:  
 CN Acetic acid, mercapto-, calcium salt (2:1) (8CI, 9CI)  
 OTHER NAMES:  
 CN Calcium thioglycolate  
 CN Calcium thioglycollate  
 CN Depil



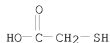
CN Ebacream  
 CN Jully  
 CN Surges  
 CN Vikor  
 MF C2 H4 O2 S . 1/2 Ca  
 CI COM  
 LC STN Files: AGRICOLA, BIOSIS, CA, CAPLUS, CHEMCATS, CHEMLIST, CIN,  
 CSCHEM, EMBASE, HSDB\*, IFICDB, IFIPAT, IFIUDB, IPA, MRCK\*, MSDS-OHS,  
 PROMT, TOXCENTER, USPATFULL, USPATOLD  
 (\*File contains numerically searchable property data)  
 Other Sources: DSL\*\*, EINECS\*\*, TSCA\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)  
 CRN (68-11-1)



● 1/2 Ca

139 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 140 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 14 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 645-74-9 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Aurate(1-), [mercaptoacetato(2-)-O,S]-, calcium (2:1) (9CI) (CA INDEX  
 NAME)  
 OTHER CA INDEX NAMES:  
 CN Acetic acid, mercapto-, calcium gold(1+) salt (2:1:2) (8CI)  
 CN Acetic acid, mercapto-, gold complex  
 OTHER NAMES:  
 CN Calcium aurothioglycolate  
 CN Calcium aurothioglycollate  
 CN Myoral  
 CN Nedaurine  
 DR 16925-54-5  
 MF C2 H4 O2 S . Au . 1/2 Ca  
 LC STN Files: CA, CAPLUS, CHEMLIST  
 Other Sources: EINECS\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)  
 CRN (68-11-1)

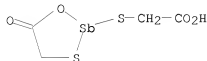


● Au(I)

● 1/2 Ca

1 REFERENCES IN FILE CA (1907 TO DATE)  
1 REFERENCES IN FILE CAPLUS (1907 TO DATE)

L7 ANSWER 15 OF 15 REGISTRY COPYRIGHT 2009 ACS on STN  
RN 539-54-8 REGISTRY  
ED Entered STN: 16 Nov 1984  
CN Acetic acid, 2-[(5-oxo-1,3,2-oxathiaastibolan-2-yl)thio]-, sodium salt  
(1:1) (CA INDEX NAME)  
OTHER CA INDEX NAMES:  
CN 1,3,2-Oxathiaastibolane, acetic acid deriv.  
CN Acetic acid, [(5-oxo-1,3,2-oxathiaastibolan-2-yl)thio]-, sodium salt (8CI,  
9CI)  
OTHER NAMES:  
CN Antimony sodium thioacetate  
CN Antimony sodium thioglycollate  
DR 1186-45-4  
MF C4 H5 O4 S2 Sb . Na  
LC STN Files: CA, CAPLUS, MRCK\*, TOXCENTER, USAN  
(\*File contains numerically searchable property data)  
CRN (1843-43-2)



● Na

3 REFERENCES IN FILE CA (1907 TO DATE)  
3 REFERENCES IN FILE CAPLUS (1907 TO DATE)

=> e octadecyl thioglycollate/cn  
E1 1 OCTADECYL THIOCYANATE/CN  
E2 1 OCTADECYL THIOGLYCOLATE/CN  
E3 0 --> OCTADECYL THIOGLYCOLLATE/CN  
E4 1 OCTADECYL THIOPEROXYDIPHOSPHATE/CN  
E5 1 OCTADECYL THIOPYROPHOSPHATE/CN  
E6 1 OCTADECYL THIOPYROPHOSPHATE, (C18H37O)4P2O2S/CN  
E7 1 OCTADECYL THIOPYROPHOSPHATE, COMPD. WITH HG12/CN  
E8 1 OCTADECYL THIOSILANE ((C18H37S)4SI)/CN  
E9 1 OCTADECYL TITANATE/CN

E10 1 OCTADECYL TITANATE(IV) ((C18H37O)(HO)3TI)/CN  
 E11 1 OCTADECYL TITANATE(IV) ((C18H37O)4TI)/CN  
 E12 1 OCTADECYL TITANATE, (C18H37O)4TI/CN

=> s e2;d

L8 1 "OCTADECYL THIOGLYCOLATE"/CN

L8 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN

RN 10220-46-9 REGISTRY

ED Entered STN: 16 Nov 1984

CN Acetic acid, 2-mercapto-, octadecyl ester (CA INDEX NAME)

OTHER CA INDEX NAMES:

CN Acetic acid, mercapto-, octadecyl ester (7CI, 8CI, 9CI)

OTHER NAMES:

CN NSC 65478

CN Octadecyl mercaptoacetate

CN Octadecyl thioglycolate

CN Stearyl thioglycolate

CN Thioglycolate octadecyl ester

CN Thioglycolic acid octadecyl ester

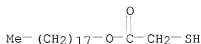
MF C20 H40 O2 S

CI COM

LC STN Files: BIOSIS, CA, CAPLUS, CHEMCATS, CHEMLIST, CSCHEM, GMELIN\*,  
 IFICDB, IFIPAT, IFIUDB, MEDLINE, TOXCENTER, USPAT2, USPATFULL, USPATOLD  
 (\*File contains numerically searchable property data)

Other Sources: EINECS\*\*, NDSL\*\*, TSCA\*\*

(\*\*Enter CHEMLIST File for up-to-date regulatory information)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

50 REFERENCES IN FILE CA (1907 TO DATE)

4 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA

50 REFERENCES IN FILE CAPLUS (1907 TO DATE)

=> e octadecylthioglycollate/cn

E1 1 OCTADECYLTHIO/CN  
 E2 1 OCTADECYLTHIO-1,4-BENZOQUINONE/CN  
 E3 0 --> OCTADECYLTHIOGLYCOLLATE/CN  
 E4 1 OCTADECYLTHIOHYDROQUINONE/CN  
 E5 1 OCTADECYLTHIOL/CN  
 E6 1 OCTADECYLTHIOSEMICARBAZIDE/CN  
 E7 1 OCTADECYLTHIOUREA/CN  
 E8 1 OCTADECYLTITANIUM TRICHLORIDE/CN  
 E9 1 OCTADECYLTOLUENESULFONIC ACID ETHANOLAMINE SALT/CN  
 E10 1 OCTADECYLTRI-DECYLSILANE/CN  
 E11 1 OCTADECYLTRIACETOXYSILANE/CN  
 E12 1 OCTADECYLTRIBUTYLAMMONIUM/CN

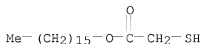
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E1 1 CETYL SULFONE/CN  
 E2 1 CETYL TETRAETHYLPHOSPHORODIAMIDITE/CN  
 E3 1 --> CETYL THIOGLYCOLATE/CN

E4 1 CETYL TITANATE/CN  
 E5 1 CETYL TOSYLATE/CN  
 E6 1 CETYL TRIFLATE/CN  
 E7 1 CETYL VINYL ETHER/CN  
 E8 1 CETYL VINYL ETHER POLYMER/CN  
 E9 1 CETYL VINYL ETHER-2,2,4-TRIMETHYL-1,3-PENTANEDIOL 1-ISOBUTYR  
 ATE 3-METHACRYLATE-VINYL CHLORIDE COPOLYMER/CN  
 E10 1 CETYL VINYL ETHER-2,2,4-TRIMETHYL-1,3-PENTANEDIOL 3-ACRYLATE  
 1-ISOBUTYRATE-VINYL CHLORIDE COPOLYMER/CN  
 E11 1 CETYL VINYL ETHER-DODECYL VINYL ETHER-MYRISTYL VINYL ETHER C  
 OPOLYMER/CN  
 E12 1 CETYL VINYL ETHER-ETHYLENE-METHYL METHACRYLATE-VINYL CHLORID  
 E COPOLYMER/CN

=> s e3;d  
 L9 1 "CETYL THIOGLYCOLATE"/CN

L9 ANSWER 1 OF 1 REGISTRY COPYRIGHT 2009 ACS on STN  
 RN 22811-02-5 REGISTRY  
 ED Entered STN: 16 Nov 1984  
 CN Acetic acid, 2-mercapto-, hexadecyl ester (CA INDEX NAME)  
 OTHER CA INDEX NAMES:  
 CN Acetic acid, mercapto-, hexadecyl ester (8CI, 9CI)  
 OTHER NAMES:  
 CN Cetyl thioglycolate  
 CN Hexadecyl mercaptoacetate  
 MF C18 H36 O2 S  
 LC STN Files: BEILSTEIN\*, BIOSIS, CA, CAPLUS, CHEMLIST, CSCHEM, GMELIN\*,  
 MEDLINE, TOXCENTER, USPATFULL  
 (\*File contains numerically searchable property data)  
 Other Sources: EINECS\*\*  
 (\*\*Enter CHEMLIST File for up-to-date regulatory information)



\*\*PROPERTY DATA AVAILABLE IN THE 'PROP' FORMAT\*\*

6 REFERENCES IN FILE CA (1907 TO DATE)  
 1 REFERENCES TO NON-SPECIFIC DERIVATIVES IN FILE CA  
 6 REFERENCES IN FILE CAPLUS (1907 TO DATE)

=> file plus  
 'PLUS' IS NOT A VALID FILE NAME  
 SESSION CONTINUES IN FILE 'REGISTRY'  
 Enter "HELP FILE NAMES" at an arrow prompt (=>) for a list of files  
 that are available. If you have requested multiple files, you can  
 specify a corrected file name or you can enter "IGNORE" to continue  
 accessing the remaining file names entered.

=> s 106-94-5 and (2885-00-9 or 2917-26-2 or 22811-02-5 or 10220-46-9)  
 1 106-94-5  
 (106-94-5/RN)  
 1 2885-00-9  
 (2885-00-9/RN)

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1 2917-26-2
  (2917-26-2/RN)
1 22811-02-5
  (22811-02-5/RN)
1 10220-46-9
  (10220-46-9/RN)
L10 0 106-94-5 AND (2885-00-9 OR 2917-26-2 OR 22811-02-5 OR 10220-46-9
    )

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COST IN U.S. DOLLARS          SINCE FILE      TOTAL
                               ENTRY      SESSION
FULL ESTIMATED COST          77.96      87.74

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)  SINCE FILE      TOTAL
                                               ENTRY      SESSION
CA SUBSCRIBER PRICE              0.00      -0.82

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 FILE LAST UPDATED: 20 May 2009 (20090520/ED)  
 REVISED CLASS FIELDS (/NCL) LAST RELOADED: Feb 2009  
 USPTO MANUAL OF CLASSIFICATIONS THESAURUS ISSUE DATE: Feb 2009

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=> s 106-94-5 and (2885-00-9 OR 2917-26-2 OR 22811-02-5 OR 10220-46-9)
    REGISTRY INITIATED
Substance data SEARCH and crossover from CAS REGISTRY in progress...
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

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REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L14            50 L13

REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L16            6 L15

REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L18            1621 L17

REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L20            2011 L19

L21            11 L12 AND ( L20 OR L18 OR L16 OR L14 )

=> s l21 and (ag or silver)  
342330 AG  
379472 SILVER

L22 1 L21 AND (AG OR SILVER)

=> d

L22 ANSWER 1 OF 1 CAPLUS COPYRIGHT 2009 ACS on STN  
AN 2004:847649 CAPLUS  
DN 141:353637  
TI Pretreatment of Ag-alloy surface with organosulfur compounds for  
tarnishing prevention  
IN Johns, Peter Gammon; Harrison, Clare Elizabeth  
PA Middlesex Silver Co. Limited, UK  
SO PCT Int. Appl., 43 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004087996	A1	20041014	WO 2004-GB1373	20040330
	W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW				
	RW: BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
	AU 2004225693	A1	20041014	AU 2004-225693	20040330
	CA 2520807	A1	20041014	CA 2004-2520807	20040330
	EP 1611267	A1	20060104	EP 2004-724313	20040330
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK				
	CN 1780937	A	20060531	CN 2004-80011375	20040330
	JP 2006523266	T	20061012	JP 2006-506057	20040330
	IN 2005DN04346	A	20070831	IN 2005-DN4346	20050926
	MX 2005010452	A	20060510	MX 2005-10452	20050928
	US 20070039665	A1	20070222	US 2005-551476	20050929
PRAI	GB 2003-7290	A	20030331		
	WO 2004-GB1373	W	20040330		

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

=> s 121 not 122

L23 10 L21 NOT L22

=> d 1-10 all

L23 ANSWER 1 OF 10 CAPLUS COPYRIGHT 2009 ACS on STN  
AN 1993:472255 CAPLUS  
DN 119:72255  
OREF 119:13013a,13016a  
ED Entered STN: 21 Aug 1993  
TI Preparation of alkanamidoammonium compounds as hair growers  
IN Yokomori, Sadakazu; Takahashi, Yuki; Misawa, Yoko; Matsumoto, Taro; Hatayama, Katsuo  
PA Taisho Pharmaceutical Co., Ltd., Japan  
SO PCT Int. Appl., 35 pp.  
CODEN: PIXXD2

DT Patent  
 LA Japanese  
 IC ICM C07C235-10  
 ICS A61K007-06; C07C317-44; C07C323-60  
 CC 23-18 (Aliphatic Compounds)  
 Section cross-reference(s): 62

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 9303005	A1	19930218	WO 1992-JP1014	19920807
	W: AU, CA, JP, KR, US				
	RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, SE				
	JP 05043529	A	19930223	JP 1991-287374	19910810
	AU 9224027	A	19930302	AU 1992-24027	19920807
	AU 656625	B2	19950209		
	CN 1082534	A	19940223	CN 1993-101376	19930210
PRAI	JP 1991-287374	A	19910810		
	WO 1992-JP1014	A	19920807		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 9303005	ICM	C07C235-10
	ICS	A61K007-06; C07C317-44; C07C323-60
	IPCI	C07C0235-10 [ICM,5]; C07C0235-00 [ICM,5,C*]; A61K0007-06 [ICS,5]; C07C0317-44 [ICS,5]; C07C0317-00 [ICS,5,C*]; C07C0323-60 [ICS,5]; C07C0323-00 [ICS,5,C*]
	IPCR	A61K0008-00 [I,C*]; A61K0008-00 [I,A]; A61K0008-30 [I,C*]; A61K0008-40 [I,A]; A61K0008-46 [I,A]; A61Q0005-00 [I,C*]; A61Q0005-00 [I,A]; A61Q0007-00 [I,C*]; A61Q0007-00 [I,A]; C07C0235-00 [I,C*]; C07C0235-06 [I,A]; C07C0235-10 [I,A]; C07C0235-16 [I,A]; C07C0235-26 [I,A]; C07C0317-00 [I,C*]; C07C0317-44 [I,A]; C07C0323-00 [I,C*]; C07C0323-52 [I,A]; C07C0323-59 [I,A]; C07C0323-60 [I,A]
	ECLA	C07C235/10; C07C317/44; C07C323/60; M07C
JP 05043529	IPCI	C07C0235-10 [ICM,5]; C07C0235-00 [ICM,5,C*]; A61K0007-06 [ICS,5]; C07C0317-44 [ICS,5]; C07C0317-00 [ICS,5,C*]; C07C0323-60 [ICS,5]; C07C0323-00 [ICS,5,C*]; A61K0008-00 [I,C*]; A61K0008-00 [I,A]; A61K0008-30 [I,C*]; A61K0008-40 [I,A]; A61K0008-46 [I,A]; A61Q0005-00 [I,C*]; A61Q0005-00 [I,A]; A61Q0007-00 [I,C*]; A61Q0007-00 [I,A]; C07C0235-00 [I,C*]; C07C0235-06 [I,A]; C07C0235-10 [I,A]; C07C0235-16 [I,A]; C07C0235-26 [I,A]; C07C0317-00 [I,C*]; C07C0317-44 [I,A]; C07C0323-00 [I,C*]; C07C0323-52 [I,A]; C07C0323-59 [I,A]; C07C0323-60 [I,A]
	ECLA	C07C235/10; C07C317/44; C07C323/60; M07C
AU 9224027	IPCI	C07C0235-10 [ICM,5]; C07C0235-00 [ICM,5,C*]; A61K0007-06 [ICS,5]; C07C0317-44 [ICS,5]; C07C0317-00 [ICS,5,C*]; C07C0323-60 [ICS,5]; C07C0323-00 [ICS,5,C*]; A61K0008-00 [I,C*]; A61K0008-00 [I,A]; A61K0008-30 [I,C*]; A61K0008-40 [I,A]; A61K0008-46 [I,A]; A61Q0005-00 [I,C*]; A61Q0005-00 [I,A]; A61Q0007-00 [I,C*]; A61Q0007-00 [I,A]; C07C0235-00 [I,C*]; C07C0235-06 [I,A]; C07C0235-10 [I,A]; C07C0235-16 [I,A]; C07C0235-26 [I,A]; C07C0317-00 [I,C*]; C07C0317-44 [I,A]; C07C0323-00 [I,C*]; C07C0323-52 [I,A]; C07C0323-59 [I,A]; C07C0323-60 [I,A]
	ECLA	C07C235/10; C07C317/44; C07C323/60; M07C
CN 1082534	IPCI	C07C0323-52 [ICM,5]; C07C0323-59 [ICS,5]; C07C0323-00 [ICS,5,C*]; C07C0235-06 [ICS,5]; C07C0235-26 [ICS,5]; C07C0235-00 [ICS,5,C*]



IPCR A61K0008-00 [I,C\*]; A61K0008-00 [I,A]; A61K0008-30 [I,C\*]; A61K0008-40 [I,A]; A61K0008-46 [I,A]; A61Q0005-00 [I,C\*]; A61Q0005-00 [I,A]; A61Q0007-00 [I,C\*]; A61Q0007-00 [I,A]; C07C0235-00 [I,C\*]; C07C0235-06 [I,A]; C07C0235-10 [I,A]; C07C0235-16 [I,A]; C07C0235-26 [I,A]; C07C0317-00 [I,C\*]; C07C0317-44 [I,A]; C07C0323-00 [I,C\*]; C07C0323-52 [I,A]; C07C0323-59 [I,A]; C07C0323-60 [I,A]; C07C235/10; C07C317/44; C07C323/60; M07C

ECLA

OS MARPAT 119:72255

AB [R1A-R2-CONR3-R4-N+R5R6R7].1/mXm- (R1 = C1-22 alkyl, C3-8 cycloalkyl; R2 = C1-15 alkylene; R3 = H, C1-5 alkyl; R4 = C2-10 alkylene; R5, R6 = C1-5 alkyl; R7 = C1-22 alkyl, C2-10 alkenyl, phenyl-C1-5 alkyl; A = O, S(O)n; n = 0-2; Xm- = anion where m = integer corresponding to the anion charge number) are prepared. Thus, thiolation of 11-bromoundecanoic acid with dodecyl mercaptan in the presence of NaOH in EtOH at 60° and amidation of the resulting 11-(dodecylthio)undecanoic acid with N,N-dimethyl-1,3-diaminopropane in refluxing xylene with removal of H2O gave N-[3-(dimethylamino)propyl]-11-(dodecylthio)undecanamide which was methylated by MeI in EtOH at room temperature for 3 days to give N-[3-[11-(dodecylthio)undecanamido]propyl]-N,N,N-trimethylammonium iodide. When 2% solution of N-benzyl-N-[3-[11-(decylthio)undecanamido]propyl]-N,N-dimethylammonium iodide in EtOH at 0.2 Ml/day for 10 days was applied to a mice in the back from which hairs were clipped, the hair-removed part showed nearly 100% hair growth vs. 0% for the control animal. A total of 41 I were prepared

ST alkanamidoammonium prepn hair grower

IT Hair preparations  
(growth stimulants, alkanamidoammonium compds.)

IT 124-38-9, Carbon dioxide, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(dry ice, reaction of, in preparation of alkanamidoammonium hair grower)

IT 148414-23-7P 148414-24-8P 148414-25-9P 148414-26-0P 148414-27-1P  
148414-28-2P 148414-29-3P 148414-30-6P 148414-31-7P 148414-32-8P  
148414-33-9P 148414-34-0P 148414-35-1P 148414-36-2P 148414-37-3P  
148414-38-4P 148414-39-5P 148414-40-8P 148414-41-9P 148414-42-0P  
148414-43-1P 148414-44-2P 148414-45-3P 148414-46-4P 148414-47-5P  
148414-48-6P 148414-49-7P 148414-50-0P 148414-51-1P 148414-52-2P  
148414-53-3P 148414-54-4P 148754-16-9P 148754-17-0P 148754-18-1P  
148754-19-2P 148754-20-5P 148754-21-6P 148754-22-7P 148754-23-8P  
148781-06-0P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of, as hair grower)

IT 1462-53-9P, 3-(Tetradecylthio)propionic acid 3062-66-6P,  
3-(Octadecylthio)propionic acid 5454-93-3P, 11-(Dodecylthio)undecanoic acid 7031-23-4P, 3-(Methylthio)propionyl chloride 83518-31-4P,  
1-(4-Bromobutoxy)tridecane 103808-51-1P, (Octadecylthio)acetic acid 103808-53-3P, 11-(Decylthio)undecanoic acid 148429-60-1P,  
11-(Isopentylthio)undecanoic acid 148429-61-2P,  
11-(Cyclohexylthio)undecanoic acid 148429-62-3P,  
5-(Tetradecylthio)valeric acid 148429-63-4P, 5-(Hexadecylthio)valeric acid 148429-64-5P, 5-(Octadecylthio)valeric acid 148429-65-6P  
148429-66-7P, 2-(Octadecylthio)propionic acid 148429-67-8P,  
3-(Tetradecylsulfonyl)propionic acid 148429-68-9P,  
3-(Octadecylsulfonyl)propionic acid 148429-69-0P, 5-(Tridecyloxy)valeric acid 148429-70-3P, 5-(Tetradecyloxy)valeric acid 148429-71-4P,  
5-(Hexadecyloxy)pentanonitrile 148429-72-5P,  
5-(Octadecyloxy)pentanonitrile 148429-73-6P 148429-74-7P  
148429-75-8P 148429-76-9P 148429-77-0P 148429-78-1P 148429-79-2P  
148429-80-5P 148429-81-6P 148429-82-7P 148429-83-8P 148429-84-9P  
148429-85-0P 148429-86-1P 148429-87-2P 148429-88-3P 148429-89-4P  
148429-90-7P 148429-91-8P 148429-92-9P 148429-93-0P 148429-94-1P

148429-95-2P 148429-96-3P 148429-97-4P 148429-98-5P 148429-99-6P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of, as intermediate for alkanamidoammonium hair grower)  
 IT 74-83-9, Methyl bromide, reactions 74-88-4, Methyl iodide, reactions  
 77-78-1 79-08-3, Bromoacetic acid 80-48-8, Methyl p-toluenesulfonate  
 80-58-0, 2-Bromobutyric acid 100-36-7, N,N-Diethyl-1,2-ethylenediamine  
 100-44-7, Benzyl chloride, reactions 104-78-9,  
 N,N-Diethyl-1,3-diaminopropane 106-94-5, Propyl bromide  
 106-95-6, Allyl bromide, reactions 108-00-9,  
 N,N-Dimethyl-1,2-ethylenediamine 109-55-7,  
 N,N-Dimethyl-1,3-diaminopropane 110-52-1, 1,4-Dibromobutane 112-55-0,  
 Dodecyl mercaptan 112-70-9, 1-Tridecanol 112-72-1, 1-Tetradecanol  
 112-92-5, 1-Octadecanol 512-56-1, Trimethyl phosphate 590-92-1,  
 3-Bromopropionic acid 598-72-1, 2-Bromopropionic acid 2067-33-6,  
 5-Bromovaleric acid 2834-05-1, 11-Bromoundecanoic acid 2885-00-9  
 Octadecyl mercaptan 5414-21-1 3653-82-4, 1-Hexadecanol 53369-71-4  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, in preparation of alkanamidoammonium hair grower)  
 RE.CNT 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE  
 (1) Anon; JP 50019719 A CAPLUS  
 (2) Anon; JP 54130509 A CAPLUS

L23 ANSWER 2 OF 10 CAPLUS COPYRIGHT 2009 ACS ON STN  
 AN 1992:263476 CAPLUS  
 DN 116:263476  
 OREF 116:44527a,44530a  
 ED Entered STN: 27 Jun 1992  
 TI Liquid heat capacity for 300 organics  
 AU Yaws, Carl L.; Pan, Xiang  
 CS Lamar Univ., Beaumont, TX, 77710, USA  
 SO Chemical Engineering (New York, NY, United States) (1992), 99(4), 130-5  
 CODEN: CHEEA3; ISSN: 0009-2460  
 DT Journal  
 LA English  
 CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)  
 Section cross-reference(s): 22  
 AB A correlation was developed for the calcn. of the heat capacities of liquid  
 organic compds. as functions of temperature (T). Values were calculated for  
 300 compds. and the coeffs. of the correlation equation,  $C_p = A + BT + CT^2$ ,  
 are listed, with T in °K and the temperature interval for which the  
 equation is valid for each compound  
 ST heat capacity org compd correlation equation  
 IT Organic compounds, properties  
 RL: PRP (Properties)  
 (heat capacities of liquid, correlation equation for)  
 IT Heat capacity  
 (of organic compds. in liquid state, correlation equations for)  
 IT 50-00-0, Formaldehyde, properties 56-23-5, Carbon tetrachloride,  
 properties 60-29-7, Ethyl ether, properties 62-53-3, Aniline,  
 properties 64-17-5, Ethyl alcohol, properties 64-18-6, Formic acid,  
 properties 64-19-7, Acetic acid, properties 65-85-0, Benzoic acid,  
 properties 66-25-1, Hexanal 67-56-1, Methanol, properties 67-63-0,  
 Isopropyl alcohol, properties 67-64-1, Acetone, properties 67-66-3,  
 Chloroform, properties 71-23-8, Propyl alcohol, properties 71-36-3,  
 Butyl alcohol, properties 71-41-0, Pentyl alcohol, properties 74-83-9,  
 Bromomethane, properties 74-87-3, Chloromethane, properties 74-88-4,  
 Iodomethane, properties 74-89-5, Methylamine, properties 74-93-1,  
 Methanethiol, properties 74-96-4, Bromoethane 75-00-3, Chloroethane  
 75-01-4, Chloroethene, properties 75-02-5, Fluoroethene 75-03-6,  
 Iodoethane 75-04-7, Ethylamine, properties 75-05-8, Acetonitrile,

properties 75-07-0, Acetaldehyde, properties 75-08-1, Ethanethiol  
 75-09-2, Dichloromethane, properties 75-10-5, Difluoromethane 75-11-6,  
 Diiodomethane 75-15-0, Carbon disulfide, properties 75-18-3, Methyl  
 sulfide 75-21-8, Ethylene oxide, properties 75-26-3, 2-Bromopropane  
 75-29-6, 2-Chloropropane 75-30-9, 2-Iodopropane 75-33-2,  
 2-Propanethiol 75-34-3, 1,1-Dichloroethane 75-35-4,  
 1,1-Dichloroethene, properties 75-36-5, Acetyl chloride 75-37-6,  
 1,1-Difluoroethane 75-38-7, 1,1-Difluoroethene 75-43-4,  
 Dichlorodifluoromethane 75-45-6, Chlorodifluoromethane 75-46-7,  
 Trifluoromethane 75-47-8, Triiodomethane 75-50-3, Trimethylamine,  
 properties 75-52-5, Nitromethane, properties 75-56-9, Propylene oxide,  
 properties 75-64-9, tert-Butylamine, properties 75-65-0, tert-Butyl  
 alcohol, properties 75-66-1, 2-Methyl-2-propanethiol 75-69-4,  
 Trichlorofluoromethane 75-71-8, Dichlorodifluoromethane 75-72-9,  
 Chlorotrifluoromethane 75-73-0, Carbon tetrafluoride 75-85-4,  
 tert-Pentyl alcohol 76-01-7, Pentachloroethane 76-13-1,  
 1,1,2-Trichlorotrifluoroethane 76-14-2, 1,2-Dichlorotetrafluoroethane  
 76-16-4, Hexafluoroethane 78-75-1, 1,2-Dibromopropane 78-76-2,  
 2-Bromobutane 78-82-0, Isobutyronitrile 78-86-4, 2-Chlorobutane  
 78-87-5, 1,2-Dichloropropane 78-92-2, sec-Butyl alcohol 78-93-3,  
 2-Butanone, properties 79-00-5, 1,1,2-Trichloroethane 79-01-6,  
 Trichloroethene, properties 79-10-7, Acrylic acid, properties 79-34-5,  
 1,1,2,2-Tetrachloroethane 95-48-7, o-Cresol, properties 95-50-1,  
 o-Dichlorobenzene 96-18-4, 1,2,3-Trichloropropane 98-08-8 106-44-5,  
 p-Cresol, properties 106-46-7, p-Dichlorobenzene 106-93-4,  
 1,2-Dibromoethane 106-94-5, 1-Bromopropane 106-95-6,  
 3-Bromo-1-propene, properties 107-03-9, 1-Propanethiol 107-05-1,  
 3-Chloro-1-propene 107-06-2, 1,2-Dichloroethane, properties 107-08-4,  
 1-Iodopropane 107-10-8, Propylamine, properties 107-12-0,  
 Propionitrile 107-13-1, Acrylonitrile, properties 107-18-6, Allyl  
 alcohol, properties 107-21-1, Ethylene glycol, properties 107-84-6,  
 1-Chloro-3-methylbutane 107-87-9, 2-Pentanone 108-20-3, Isopropyl  
 ether 108-24-7, Acetic anhydride 108-39-4, m-Cresol, properties  
 108-86-1, Bromobenzene, properties 108-90-7, Chlorobenzene, properties  
 108-95-2, Phenol, properties 108-98-5, Benzenethiol, properties  
 108-99-6, 3-Picoline 109-06-8, 2-Picoline 109-65-9, 1-Bromobutane  
 109-69-3, 1-Chlorobutane 109-73-9, Butylamine, properties 109-74-0,  
 Butyronitrile 109-79-5, 1-Butanethiol 109-89-7, Diethylamine,  
 properties 110-00-9, Furan 110-01-0, Thiacyclopentane 110-02-1,  
 Thiophene 110-53-2, 1-Bromopentane 110-62-3, Valeraldehyde 110-66-7,  
 1-Pentanethiol 110-81-6, Ethyl disulfide 110-86-1, Pyridine,  
 properties 111-27-3, Hexyl alcohol, properties 111-31-9, 1-Hexanethiol  
 111-43-3, Propyl ether 111-47-7, Propyl sulfide 111-70-6, Heptyl  
 alcohol 111-71-7, Heptanal 111-87-5, Octyl alcohol, properties  
 111-88-6, 1-Octanethiol 112-30-1, Decyl alcohol 112-31-2, Decanal  
 112-42-5, Undecyl alcohol 112-51-6, Pentyl disulfide 112-53-8, Dodecyl  
 alcohol 112-55-0, 1-Dodecanethiol 112-70-9, 1-Tridecanol 112-72-1,  
 1-Tetradecanol 112-92-5, 1-Octadecanol 115-10-6, Methyl ether  
 115-25-3, Octafluorocyclobutane 121-44-8, Triethylamine, properties  
 123-38-6, Propionaldehyde, properties 123-72-8, Butyraldehyde  
 123-75-1, Pyrrolidine, properties 124-13-0, Octanal 124-19-6, Nonanal  
 124-38-9, Carbon dioxide, properties 124-40-3, Dimethylamine, properties  
 127-18-4, Tetrachloroethene, properties 141-78-6, Ethyl acetate,  
 properties 142-28-9, 1,3-Dichloropropane 142-96-1, Butyl ether  
 143-08-8, Nonyl alcohol 143-10-2, 1-Decanethiol 151-56-4,  
 Ethylenimine, properties 156-59-2, cis-1,2-Dichloroethene 156-60-5,  
 trans-1,2-Dichloroethene 287-27-4, Thiacyclobutane 352-32-9,  
 p-Fluorotoluene 352-93-2, Ethylsulfide 353-36-6, Fluoroethane  
 359-11-5, Trifluoroethene 367-11-3, o-Difluorobenzene 372-18-9,  
 m-Difluorobenzene 420-12-2, Thiacyclopentane 420-26-8, 2-Fluoropropane  
 420-46-2, 1,1,1-Trifluoroethane 460-13-9, 1-Fluoropropane 462-06-6,  
 Fluorobenzene 463-58-1, Carbonyl sulfide 507-19-7,

2-Bromo-2-methylpropane 507-20-0, 2-Chloro-2-methylpropane 513-36-0,  
 1-Chloro-2-methylpropane 513-44-0, 2-Methyl-1-propanethiol 513-53-1,  
 2-Butanethiol 533-98-2, 1,2-Dibromobutane 540-36-3, p-Disulfobenzene  
 540-54-5, 1-Chloropropane 540-67-0, Ethyl methyl ether 541-73-1,  
 m-Dichlorobenzene 543-59-9, 1-Chloropentane 544-40-1, Butyl sulfide  
 554-14-3, 2-Methylthiophene 556-56-9, 3-Iodo-1-propene 557-17-5,  
 Methyl propyl ether 558-17-8, 2-Iodo-2-methylpropane 591-50-4,  
 Iodobenzene 593-53-3, Fluoromethane 593-60-2, Bromoethylene  
 593-70-4, Chlorofluoromethane 594-20-7, 2,2-Dichloropropane 594-36-5,  
 2-Chloro-2-methylbutane 594-51-4, 2,3-Dibromo-2-methylbutane 598-29-8,  
 1,2-Diiodopropane 598-53-8, Methyl isopropyl ether 616-44-4,  
 3-Methylthiophene 624-73-7, 1,2-Diiodoethane 624-89-5, Ethyl methyl  
 sulfide 624-92-0, Methyl disulfide 625-80-9, Isopropyl sulfide  
 628-29-5, Butyl methyl sulfide 629-19-6, Propyl disulfide 629-45-8,  
 Butyl disulfide 629-65-2, Heptyl sulfide 629-76-5, 1-Pentadecanol  
 629-96-9, 1-Eicosanol 630-08-0, Carbon monoxide, properties 638-46-0,  
 Butyl ethyl sulfide 693-83-4, Decyl sulfide 822-27-5, Octyl disulfide  
 872-10-6, Pentyl sulfide 929-98-6, Nonyl sulfide 1454-84-8,  
 1-Nonadecanol 1454-85-9, 1-Heptadecanol 1455-21-6, 1-Nonanethiol  
 1551-21-9, Isopropyl methyl sulfide 1613-46-3, Butyl propyl sulfide  
 1613-51-0, Thiacyclohexane 1630-77-9, cis-1,2-Difluoroethene  
 1630-78-0, trans-1,2-Difluoroethene 1634-04-4, Methyl-tert-butyl ether  
 1639-09-4, 1-Heptanethiol 1679-07-8, Cyclopentanethiol 1679-09-0,  
 2-Methyl-2-butanethiol 1741-83-9, Methyl pentyl sulfide 2079-95-0,  
 1-Tetradecanethiol 2690-08-6, Octyl sulfide 2851-83-4, Dodecyl ethyl  
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 1-Hexadecanethiol 3698-89-3, Dodecyl methyl sulfide 3698-93-9, Octyl  
 propyl sulfide 3698-94-0, Ethyl octyl sulfide 3698-95-1, Methyl octyl  
 sulfide 3877-15-4, Methyl propyl sulfide 4110-50-3 4485-77-2, Nonyl  
 disulfide 4753-80-4, Thiacycloheptane 5332-52-5, 1-Unadecanethiol  
 5408-86-6, 2,3-Dibromobutane 6163-66-2, tert-Butyl ether 6294-31-1,  
 Hexyl sulfide

RL: PRP (Properties)

(heat capacity of, correlation equation for)

IT 6863-58-7, sec-Butyl ether 7289-44-3, Methyl undecyl sulfide  
 7289-45-4, Methyl tetradecyl sulfide 7309-44-6, Ethyl hexyl sulfide  
 10496-15-8, Hexyl disulfide 10496-16-9, Heptyl disulfide 10496-18-1,  
 Decyl disulfide 13373-97-2, 1-Eicosanethiol 13952-84-6, sec-Butylamine  
 16900-07-5, Butyl octyl sulfide 16900-08-6, Butyl dodecyl sulfide  
 16967-04-7, Butyl hexyl sulfide 17348-59-3, Isopropyl-tert-butyl ether  
 18437-89-3, Butyl hexadecyl sulfide 19313-57-6, Butyl decyl sulfide  
 19313-61-2, Decyl ethyl sulfide 19484-26-5, 1-Tridecanethiol  
 20291-60-5, Hexyl methyl sulfide 20291-61-6, Heptyl methyl sulfide  
 22438-39-7, Decyl methyl sulfide 24768-42-1, Butyl pentyl sulfide  
 24768-43-2, Hexyl propyl sulfide 24768-44-3, Ethyl heptyl sulfide  
 24768-46-5, Heptyl propyl sulfide 25276-70-4, 1-Pentadecanethiol  
 26158-99-6, Ethyl pentyl sulfide 27563-68-4, Hexadecyl methyl sulfide  
 36653-82-4, 1-Hexadecanol 40289-98-3, Methyl octadecyl sulfide  
 40813-84-1, Butyl heptyl sulfide 41947-84-6, Ethyl octadecyl sulfide  
 42841-80-5, Pentyl propyl sulfide 53161-72-1, 1,2-Diiodobutane  
 53193-22-9, 1-Heptadecanethiol 53193-23-0, 1-Nonadecanethiol  
 59973-07-8, Methyl nonyl sulfide 59973-08-9, Ethyl nonyl sulfide  
 62103-66-6, Nonyl propyl sulfide 62155-09-3, Methyl tridecyl sulfide  
 62155-10-6, Methyl pentadecyl sulfide 62155-11-7, Heptadecyl methyl  
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 pentadecyl sulfide 66271-54-3, Ethyl tetradecyl sulfide 66271-55-4,  
 Propyl tridecyl sulfide 66271-81-6, Ethyl tridecyl sulfide 66271-82-7,  
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 Ethyl hexadecyl sulfide 66292-32-8, Pentadecyl propyl sulfide  
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Ethyl undecyl sulfide 66577-31-9, Decyl propyl sulfide 66577-32-0,  
 Butyl nonyl sulfide 66577-61-5, Propyl tetradecyl sulfide 66577-62-6,  
 Butyl tridecyl sulfide 66826-84-4, Propyl undecyl sulfide  
 RL: PRP (Properties)  
 (heat capacity of, correlation equation for)

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TI 633 organic chemicals: surface tension data

AU Yaws, Carl L.; Yang, Haur Chung; Pan, Xiang

CS Lamar Univ., Beaumont, TX, USA

SO Chemical Engineering (New York, NY, United States) (1991), 98(3), 140-2,

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LA English

CC 66-1 (Surface Chemistry and Colloids)

AB Surface tension data are tabulated for 633 organic chems., including hydrocarbons, alcs., and acids. Exptl. data from the literature were used to calculate estimated values for chems. for which no exptl. data exist.

Surface

tensions at any temperature can be calculated using the Othmer relation, which is discussed.

ST surface tension org chem

IT Surface tension

(of hydrocarbons and sulfides)

IT Organic compounds, properties

RL: PRP (Properties)

(surface tension data for)

IT 56-23-5, Carbon tetrachloride, properties 60-29-7, Ethyl ether, properties 62-53-3, Aniline, properties 64-17-5, Ethyl alcohol, properties 64-18-6, Formic acid, properties 64-19-7, Acetic acid, properties 67-56-1, Methanol, properties 67-63-0, 2-Propanol, properties 67-64-1, Acetone, properties 67-66-3, Chloroform, properties 71-23-8, Propyl alcohol, properties 71-36-3, Butyl alcohol, properties 71-41-0, Pentyl alcohol, properties 71-43-2, Benzene, properties 74-82-8, Methane, properties 74-84-0, Ethane, properties 74-85-1, Ethene, properties 74-86-2, Acetylene, properties 74-87-3, Chloromethane, properties 74-88-4, Iodomethane, properties 74-89-5, Methanamine, properties 74-93-1, Methanethiol, properties 74-96-4, Bromoethane 74-98-6, Propane, properties 74-99-7, Propyne 75-00-3, Chloroethane 75-01-4, properties 75-02-5, Fluoroethene 75-03-6, Iodoethane 75-04-7, Ethylamine, properties 75-05-8, Acetonitrile, properties 75-07-0, Acetaldehyde, properties 75-08-1, Ethanethiol 75-09-2, Dichloromethane, properties 75-11-6, Diiodomethane 75-15-0, Carbon disulfide, properties 75-18-3, Methyl sulfide 75-19-4, Cyclopropane 75-21-8, Oxirane, properties 75-26-3, 2-Bromopropane 75-28-5 75-29-6, 2-Chloropropane 75-30-9, 2-Iodopropane 75-33-2, 2-Propanethiol 75-34-3, 1,1-Dichloroethane 75-37-6, 1,1-Difluoroethane 75-38-7, 1,1-Difluoroethene 75-43-4, Dichlorofluoromethane 75-45-6, Chlorodifluoromethane 75-46-7, Trifluoromethane 75-50-3, Trimethylamine, properties 75-52-5, Nitromethane, properties 75-64-9, properties 75-65-0, tert-Butyl alcohol, properties 75-66-1, 2-Methyl-2-propanethiol 75-69-4, Trichlorofluoromethane 75-71-8, Dichlorodifluoromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Carbon tetrafluoride 75-83-2, 2,2-Dimethylbutane 75-85-4, tert-Pentyl alcohol 76-01-7, Pentachloroethane 76-13-1, 1,1,2-Trichloro-1,2,2-trifluoroethane 76-14-2,

1,2-Dichloro-1,1,2,2-tetrafluoroethane 76-15-3 76-16-4,  
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 107-06-2, 1,2-Dichloroethane, properties 107-08-4, 1-Iodopropane  
 107-10-8, Propylamine, properties 107-12-0, Propionitrile 107-13-1,  
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 107-21-1, 1,2-Ethanediol, properties 107-83-5, 2-Methylpentane  
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 108-67-8, properties 108-86-1, Bromobenzene, properties 108-87-2,  
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 Chlorobenzene, properties 108-93-0, Cyclohexanol, properties 108-95-2,  
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 1-Bromobutane 109-66-0, Pentane, properties 109-67-1, 1-Pentene  
 109-69-3, 1-Chlorobutane 109-73-9, Butylamine, properties 109-74-0,  
 Butanenitrile 109-79-5, 1-Butanethiol 109-89-7, properties 110-01-0,  
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 properties 111-27-3, Hexyl alcohol, properties 111-31-9, 1-Hexanethiol  
 111-43-3, Propyl ether 111-47-7, Propyl sulfide 111-65-9, Octane,  
 properties 111-66-0, 1-Octene 111-71-7, Heptanal 111-84-2, Nonane  
 111-87-5, Octyl alcohol, properties 111-88-6, 1-Octanethiol 112-30-1,  
 Decyl alcohol 112-40-3, Dodecane 112-41-4, 1-Dodecene 112-51-6  
 112-55-0, 1-Dodecanethiol 112-88-9, 1-Octadecene 112-95-8, Eicosane  
 115-07-1, 1-Propene, properties 115-10-6, Methyl ether 115-11-7,  
 properties 115-25-3, Octafluorocyclobutane 121-44-8, properties  
 123-01-3, 1-Phenyl dodecane 123-02-4, 1-Phenyl tridecane 123-38-6,  
 Propanal, properties 123-72-8, Butanal 123-75-1, Pyrrolidine,  
 properties 123-91-1, p-Dioxane, properties 124-11-8, 1-Nonene  
 124-13-0, Octanal 124-18-5, Decane 124-38-9, Carbon dioxide,  
 properties 124-40-3, properties 127-18-4, Tetrachloroethane,  
 properties 135-01-3, o-Diethylbenzene 141-78-6, Ethyl acetate,  
 properties 141-93-5, m-Diethylbenzene 142-28-9, 1,3-Dichloropropane  
 142-29-0, Cyclopentane 142-82-5, Heptane, properties 142-96-1, Butyl  
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 Aziridine, properties 156-59-2 156-60-5 157-40-4, Spiropentane  
 275-51-4, Azulene 287-23-0, Cyclobutane 287-27-4, Thiacyclobutane  
 287-92-3, Cyclopentane 291-64-5, Cycloheptane 292-64-8, Cyclooctane  
 352-32-9, p-Fluorotoluene 352-93-2, Ethyl sulfide 372-18-9 420-12-2,

Thiacyclopentane 460-12-8, Butadiyne 462-06-6, Fluorobenzene 463-49-0, Allene 463-58-1, Carbonyl sulfide 463-82-1 464-06-2, 2,2,3-Trimethylbutane 488-23-3, 1,2,3,4-Tetramethylbenzene 493-01-6, cis-Decahydronaphthalene 493-02-7, trans-Decahydronaphthalene 503-17-3, 2-Butyne 513-35-9, 2-Methyl-2-butene 513-36-0, 1-Chloro-2-methylpropane 513-44-0, 2-Methyl-1-propanethiol 513-53-1, 2-Butanethiol 526-73-8, 1,2,3-Trimethylbenzene 527-53-7, 1,2,3,5-Tetramethylbenzene 536-74-3, Ethynylbenzene 538-68-1, Pentylbenzene 540-36-3, p-Difluorobenzene 540-54-5, 1-Chloropropane 540-67-0, Ethyl methyl ether 540-84-1 541-73-1, m-Dichlorobenzene RL: PRP (Properties)

(surface tension data for)

IT 543-59-9, 1-Chloropentane 544-25-2, 1,3,5-Cycloheptatriene 544-40-1, Butyl sulfide 544-76-3, Hexadecane 554-14-3, 2-Methylthiophene 556-56-9, 3-Iodo-1-propene 558-37-2, 3,3-Dimethyl-1-butene 560-21-4, 2,3,3-Trimethylpentane 562-49-2 563-16-6, 3,3-Dimethylhexane 563-45-1, 3-Methyl-1-butene 563-46-2, 2-Methyl-1-butene 563-78-0, 2,3-Dimethyl-1-butene 563-79-1, 2,3-Dimethyl-2-butene 564-02-3, 2,2,3-Trimethylpentane 565-59-3 565-75-3, 2,3,4-Trimethylpentane 571-58-4, 1,4-Dimethylnaphthalene 571-61-9, 1,5-Dimethylnaphthalene 573-98-8, 1,2-Dimethylnaphthalene 575-37-1, 1,7-Dimethylnaphthalene 575-41-7, 1,3-Dimethylnaphthalene 575-43-9, 1,6-Dimethylnaphthalene 581-40-8, 2,3-Dimethylnaphthalene 581-42-0, 2,6-Dimethylnaphthalene 582-16-1, 2,7-Dimethylnaphthalene 583-48-2, 3,4-Dimethylhexane 584-94-1, 2,3-Dimethylhexane 589-34-4, 3-Methylhexane 589-43-5, 2,4-Dimethylhexane 589-53-7, 4-Methylheptane 589-81-1, 3-Methylheptane 590-18-1, cis-2-Butene 590-19-2, 1,2-Butadiene 590-35-2 590-66-9, 1,1-Dimethylcyclohexane 590-73-8, 2,2-Dimethylhexane 591-50-4, Iodobenzene 591-76-4, 2-Methylhexane 591-93-5, 1,4-Pentadiene 591-95-7, 1,2-Pentadiene 591-96-8, 2,3-Pentadiene 592-13-2, 2,5-Dimethylhexane 592-27-8, 2-Methylheptane 592-41-6, 1-Hexene, properties 592-76-7, 1-Heptene 593-45-3, Octadecane 593-60-2, Bromoethylene 594-36-5, 2-Chloro-2-methylbutane 594-82-1, 2,2,3,3-Tetramethylbutane 598-23-2, 3-Methyl-1-butene 598-25-4, 3-Methyl-1,2-butadiene 600-24-8, 2-Nitrobutane 604-88-6, Hexaethylbenzene 605-01-6, Pentaethylbenzene 609-26-7, 3-Ethyl-2-methylpentane 611-14-3, o-Ethyltoluene 611-15-4, o-Methylstyrene 616-12-6, trans-3-Methyl-2-pentene 616-44-4, 3-Methylthiophene 617-78-7, 3-Ethylpentane 619-99-8, 3-Ethylhexane 620-14-4, m-Ethyltoluene 622-96-8, p-Ethyltoluene 622-97-9, p-Methylstyrene 624-29-3, cis-1,4-Dimethylcyclohexane 624-64-6, trans-2-Butene 624-89-5, Ethyl methyl sulfide 624-92-0, Methyl disulfide 625-27-4, 2-Methyl-2-pentene 625-58-1, Ethyl nitrate 625-80-9, Isopropyl sulfide 627-05-4, 1-Nitrobutane 627-13-4, Propyl nitrate 627-19-0, 1-Pentyne 627-20-3, cis-2-Pentene 627-21-4, 2-Pentyne 628-29-5, Butyl methyl sulfide 628-71-7, 1-Heptyne 629-05-0, 1-Octyne 629-20-9, 1,3,5,7-Cyclooctatetraene 629-45-8, Butyl disulfide 629-50-5, Tridecane 629-59-4, Tetradecane 629-62-9, Pentadecane 629-65-2, Heptyl sulfide 629-73-2, 1-Hexadecene 629-74-3, 1-Hexanecyane 629-78-7, Heptadecane 629-89-0, 1-Octadecyne 629-92-5, Nonadecane 630-08-0, Carbon monoxide, properties 635-81-4, 1,2,4,5-Tetraethylbenzene 638-04-0, cis-1,3-Dimethylcyclohexane 638-46-0, Butyl ethyl sulfide 642-32-0, 1,2,3,4-Tetraethylbenzene 646-04-8, trans-2-Pentene 674-76-0, trans-4-Methyl-2-pentene 689-97-4, 1-Buten-3-yne 691-37-2 691-38-3, cis-4-Methyl-2-pentene 693-02-7, 1-Hexyne 693-83-4, Decyl sulfide 693-89-0, 1-Methylcyclopentene 700-12-9, Pentamethylbenzene 760-20-3, 3-Methyl-1-pentene 760-21-4, 2-Ethyl-1-butene 763-29-1, 2-Methyl-1-pentene 764-93-2, 1-Decyne 765-03-7, 1-Dodecyne 765-10-6, 1-Tetradecyne 765-13-9, 1-Pentadecyne 765-27-5, 1-Eicosyne 766-90-5, cis-Propenylbenzene 821-95-4, 1-Undecene 822-27-5, Octyl disulfide 822-35-5, Cyclobutene 822-50-4, trans-1,2-Dimethylcyclopentane 871-83-0, 2-Methylnonane 872-05-9,

1-Decene 872-10-6, Pentyl sulfide 873-66-5, trans-Propenylbenzene  
 877-44-1, 1,2,4-Triethylbenzene 921-47-1, 2,3,4-Trimethylhexane  
 922-28-1, 3,4-Dimethylheptane 922-62-3, cis-3-Methyl-2-pentene  
 926-82-9, 3,5-Dimethylheptane 929-98-6, Nonyl sulfide 939-27-5,  
 2-Ethyl-naphthalene 1067-08-9, 3-Ethyl-3-methylpentane 1067-20-5,  
 3,3-Diethylpentane 1068-19-5, 4,4-Dimethylheptane 1068-87-7,  
 3-Ethyl-2,4-dimethylpentane 1069-53-0, 2,3,5-Trimethylhexane  
 1070-87-7, 2,2,4,4-Tetramethylpentane 1071-26-7, 2,2-Dimethylheptane  
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 1072-16-8, 2,7-Dimethyloctane 1077-16-3, Hexylbenzene 1078-71-3,  
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 1-Phenylhexadecane 1459-10-5, 1-Phenyltetradecane 1551-21-9, Isopropyl  
 methyl sulfide 1574-41-0, cis-1,3-Pentadiene 1613-46-3, Butyl propyl  
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 2207-03-6, trans-1,3-Dimethylcyclohexane 2207-04-7,  
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 2216-30-0, 2,5-Dimethylheptane 2216-32-2, 4-Ethylheptane 2216-33-3,  
 3-Methyloctane 2216-34-4, 4-Methyloctane 2243-98-3, 1-Undecyne  
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 2613-61-8, 2,4,6-Trimethylheptane 2690-08-6, Octyl sulfide 2765-18-6,  
 1-Propyl-naphthalene 2851-83-4, Dodecyl ethyl sulfide 2882-98-6,  
 1-Cyclopentylnonane 2883-02-5, 1-Cyclohexylnonane 2885-00-9,  
 1-Octadecanethiol 2917-26-2, 1-Hexadecanethiol 3074-71-3,  
 2,3-Dimethylheptane 3074-75-7, 4-Ethyl-2-methylhexane 3074-76-8,  
 3-Ethyl-3-methylhexane 3074-77-9, 3-Ethyl-4-methylhexane 3178-29-8,  
 4-Propylheptane 3221-61-2, 2-Methyloctane 3452-07-1, 1-Eicosene  
 3452-09-3, 1-Nonyne 3522-94-9, 2,2,5-Trimethylhexane 3698-89-3,  
 Dodecyl methyl sulfide 3698-93-9, Octyl propyl sulfide 3698-94-0,  
 Ethyl octyl sulfide 3698-95-1, Methyl octyl sulfide 3741-00-2,  
 1-Cyclopentylpentane 3877-15-4, Methyl propyl sulfide 4032-86-4,  
 3,3-Dimethylheptane 4032-92-2, 2,4,4-Trimethylheptane 4032-93-3,  
 2,3,6-Trimethylheptane 4032-94-4, 2,4-Dimethyloctane 4050-45-7,  
 trans-2-Hexene 4110-44-5, 3,3-Dimethyloctane 4110-50-3, Ethyl propyl  
 sulfide 4292-92-6, Pentylcyclohexane 4457-00-5, 1-Cyclopentylhexane  
 4485-77-2, Nonyl disulfide 4669-01-6, 1-Cyclopentylpentadecane  
 4753-80-4, Thiacycloheptane 5171-84-6, 3,3,4,4-Tetramethylhexane  
 5332-52-5, 1-Undecanethiol 5617-41-4, 1-Cyclohexylheptane 5617-42-5,  
 1-Cyclopentylheptane 5634-30-0, 1-Cyclopentylidodecane  
 RL: PRP (Properties)

(surface tension data for)

IT 5881-17-4, 3-Ethylheptane 5911-04-6, 3-Methylnonane 6006-33-3,  
 1-Cyclohexyltridecane 6006-34-4, 1-Cyclopentyltridecane 6006-95-7,  
 1-Cyclohexylpentadecane 6294-31-1, Hexyl sulfide 6742-54-7,



1-Phenylundecane 6765-39-5, 1-Heptadecene 6785-23-5,  
 1-Cyclopentylundecane 6812-38-0, 1-Cyclohexylhexadecane 6812-39-1,  
 1-Cyclopentylhexadecane 6876-18-2, 3-Isopropyl-2-methylhexane  
 6876-23-9, trans-1,2-Dimethylcyclohexane 7146-60-3, 2,3-Dimethyloctane  
 7154-79-2, 2,2,3,3-Tetramethylpentane 7154-80-5, 3,3,5-Trimethylheptane  
 7220-26-0, 3-Ethyl-2,4-dimethylhexane 7289-44-3, Methyl undecyl sulfide  
 7289-45-4, Methyl tetradecyl sulfide 7309-44-6, Ethyl hexyl sulfide  
 7372-86-3, 2-Ethyl-6-methylnaphthalene 7642-09-3, cis-3-Hexene  
 7688-21-3, cis-2-Hexene 10496-15-8, Hexyl disulfide 10496-16-9, Heptyl  
 disulfide 13269-52-8, trans-3-Hexene 13360-61-7, 1-Pentadecene  
 13373-97-2, 1-Eicosanethiol 13475-78-0, 5-Ethyl-2-methylheptane  
 13475-79-1 13475-81-5, 2,2,3,3-Tetramethylhexane 13952-84-6,  
 sec-Butylamine 14676-29-0, 3-Ethyl-2-methylheptane 14720-74-2,  
 2,2,4-Trimethylheptane 15869-80-4, 3-Ethylheptane 15869-85-9,  
 5-Methylnonane 15869-86-0, 4-Ethylheptane 15869-87-1,  
 2,2-Dimethyloctane 15869-89-3, 2,5-Dimethyloctane 15869-92-8,  
 3,4-Dimethyloctane 15869-93-9, 3,5-Dimethyloctane 15869-94-0,  
 3,6-Dimethyloctane 15869-95-1, 4,4-Dimethyloctane 15869-96-2,  
 4,5-Dimethyloctane 16747-25-4, 2,2,3-Trimethylhexane 16747-26-5,  
 2,2,4-Trimethylhexane 16747-28-7, 2,3,3-Trimethylhexane 16747-30-1,  
 2,4,4-Trimethylhexane 16747-31-2, 3,3,4-Trimethylhexane 16747-32-3,  
 3-Ethyl-2,2-dimethylpentane 16747-33-4, 3-Ethyl-2,3-dimethylpentane  
 16747-38-9, 2,3,3,4-Tetramethylpentane 16747-42-5,  
 2,2,4,5-Tetramethylhexane 16747-44-7, 2,2,3,3,4-Pentamethylpentane  
 16747-45-8, 2,2,3,4,4-Pentamethylpentane 16789-46-1,  
 3-Ethyl-2-methylhexane 16900-07-5, Butyl octyl sulfide 16900-08-6,  
 Butyl dodecyl sulfide 16967-04-7, Butyl hexyl sulfide 17059-55-1,  
 2-Ethyl-7-methylnaphthalene 17301-94-9, 4-Methylnonane 17302-01-1,  
 3-Ethyl-3-methylheptane 17302-02-2, 3,3-Diethylhexane 17302-04-4,  
 4-Ethyl-4-methylheptane 18435-45-5, 1-Nonadecene 18437-89-3, Butyl  
 hexadecyl sulfide 19313-57-6, Butyl decyl sulfide 19313-61-2, Decyl  
 ethyl sulfide 19398-77-7, 3,4-Diethylhexane 19484-26-5,  
 1-Tridecanethiol 20278-84-6, 2,4,5-Trimethylheptane 20278-85-7,  
 2,3,5-Trimethylheptane 20278-87-9, 3,3,4-Trimethylheptane 20278-88-0,  
 3,4,4-Trimethylheptane 20278-89-1, 3,4,5-Trimethylheptane 20291-60-5,  
 Hexyl methyl sulfide 20291-61-6, Heptyl methyl sulfide 20291-91-2,  
 3-Ethyl-2,2-dimethylhexane 20291-95-6, 2,2,5-Trimethylheptane  
 22438-39-7, Decyl methyl sulfide 24768-42-1, Butyl pentyl sulfide  
 24768-43-2, Hexyl propyl sulfide 24768-44-3, Ethyl heptyl sulfide  
 24768-46-5, Heptyl propyl sulfide 25276-70-4, 1-Pentadecanethiol  
 26158-99-6, Ethyl pentyl sulfide 26186-00-5, 1-Heptadecene 26186-01-6,  
 1-Nonadecene 26186-02-7, 1-Tridecene 27563-68-4, Hexadecyl methyl  
 sulfide 31032-94-7, 2-Ethyl-3-methylnaphthalene 38842-05-6,  
 1,2,3,5-Tetraethylbenzene 40289-98-3, Methyl octadecyl sulfide  
 40813-84-1, Butyl heptyl sulfide 41947-84-6, Ethyl octadecyl sulfide  
 42205-08-3, 1,2,3-Trimethylbenzene 42841-80-5, Pentyl propyl sulfide  
 51750-65-3, 2,2,4,4-Tetramethylhexane 52896-87-4, 4-Isopropylheptane  
 52896-88-5, 4-Ethyl-2-methylheptane 52896-89-6, 4-Ethyl-3-methylheptane  
 52896-90-9, 3-Ethyl-5-methylheptane 52896-91-0, 3-Ethyl-4-methylheptane  
 52896-92-1, 2,2,3-Trimethylheptane 52896-93-2, 2,3,3-Trimethylheptane  
 52896-95-4, 2,3,4-Trimethylheptane 52896-99-8,  
 4-Ethyl-2,2-dimethylhexane 52897-00-4, 3-Ethyl-2,3-dimethylhexane  
 52897-01-5, 4-Ethyl-2,3-dimethylhexane 52897-03-7,  
 4-Ethyl-2,4-dimethylhexane 52897-04-8, 3-Ethyl-2,5-dimethylhexane  
 52897-05-9, 4-Ethyl-3,3-dimethylhexane 52897-06-0,  
 3-Ethyl-3,4-dimethylhexane 52897-08-2, 2,2,3,4-Tetramethylhexane  
 52897-09-3, 2,2,3,5-Tetramethylhexane 52897-10-6,  
 2,3,3,4-Tetramethylhexane 52897-11-7, 2,3,3,5-Tetramethylhexane  
 52897-12-8, 2,3,4,4-Tetramethylhexane 52897-15-1,  
 2,3,4,5-Tetramethylhexane 52897-16-2, 3,3-Diethyl-2-methylpentane  
 52897-17-3, 3-Ethyl-2,2,3-trimethylpentane 52897-18-4,  
 3-Ethyl-2,2,4-trimethylpentane 52897-19-5,

3-Ethyl-2,3,4-trimethylpentane 53193-22-9, 1-Heptadecanethiol  
 53193-23-0, 1-Nonadecanethiol 54105-66-7, 1-Cyclohexylundecane  
 59973-07-8, Methyl nonyl sulfide 59973-08-9, Ethyl nonyl sulfide  
 62103-66-6, Nonyl propyl sulfide 62155-09-3, Methyl tridecyl sulfide  
 62155-10-6, Methyl pentadecyl sulfide 62155-11-7, Heptadecyl methyl  
 sulfide 62155-12-8, Methyl nonadecyl sulfide 64919-20-6, Ethyl  
 pentadecyl sulfide 66271-54-3, Ethyl tetradecyl sulfide 66271-55-4,  
 Propyl tridecyl sulfide 66271-81-6, Ethyl tridecyl sulfide 66271-82-7,  
 Dodecyl propyl sulfide 66271-83-8, Butyl undecyl sulfide 66292-31-7,  
 Ethyl hexadecyl sulfide 66292-32-8, Pentadecyl propyl sulfide  
 66292-33-9, Butyl tetradecyl sulfide 66359-40-8, Ethyl heptadecyl  
 sulfide 66359-41-9, Hexadecyl propyl sulfide 66359-42-0, Butyl  
 pentadecyl sulfide 66455-35-4, Heptadecyl propyl sulfide 66577-30-8,  
 Ethyl undecyl sulfide 66577-31-9, Decyl propyl sulfide 66577-32-0,  
 Butyl nonyl sulfide 66577-61-5, Propyl tetradecyl sulfide 66577-62-6,  
 Butyl tridecyl sulfide 66826-84-4, Propyl undecyl sulfide  
 RL: PRP (Properties)  
 (surface tension data for)

L23 ANSWER 4 OF 10 CAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1990:485738 CAPLUS  
 DN 113:85738  
 OREF 113:14355a,14358a  
 ED Entered STN: 01 Sep 1990  
 TI Predict enthalpy of vaporization  
 AU Yaws, C. L.; Yang, H. C.; Cawley, W. A.  
 CS Lamar Univ., Beaumont, TX, USA  
 SO Hydrocarbon Processing, International Edition (1990), 69(6), 87-90  
 CODEN: IHPRBS; ISSN: 0018-8190  
 DT Journal  
 LA English  
 CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)  
 AB The enthalpy of vaporization at a given temperature is related to other  
 properties for the major organic compds.  
 ST enthalpy vaporization org compd  
 IT Heat of evaporation and Heat of condensation  
 (calcn. of, of organic compds.)  
 IT Organic compounds, properties  
 RL: PRP (Properties)  
 (heats of evaporation of, calcn. of)  
 IT 50-00-0, Formaldehyde, properties 56-23-5, Carbon tetrachloride,  
 properties 60-29-7, Ethyl ether, properties 62-53-3, Benzenamine,  
 properties 64-17-5, Ethanol, properties 64-18-6, Formic acid,  
 properties 64-19-7, Acetic acid, properties 65-85-0, Benzoic acid,  
 properties 66-25-1, Hexanal 67-56-1, Methanol, properties 67-63-0,  
 2-Propanol, properties 67-64-1, 2-Propanone, properties 67-66-3,  
 properties 67-72-1, Hexachloroethane 71-23-8, Propyl alcohol,  
 properties 71-36-3, 1-Butanol, properties 71-41-0, Pentyl alcohol,  
 properties 71-43-2, Benzene, properties 74-82-8, Methane, properties  
 74-83-9, properties 74-84-0, Ethane, properties 74-85-1, Ethene,  
 properties 74-86-2, Ethyne, properties 74-87-3, properties 74-88-4,  
 properties 74-89-5, Methanamine, properties 74-93-1, Methanethiol,  
 properties 74-96-4, Bromoethane 74-98-6, Propane, properties  
 74-99-7, 1-Propyne 75-00-3, Chloroethane 75-01-4, properties  
 75-02-5, Fluoroethene 75-03-6, Iodoethane 75-04-7, Ethanamine,  
 properties 75-05-8, Acetonitrile, properties 75-07-0, Acetaldehyde,  
 properties 75-08-1, Ethanethiol 75-09-2, properties 75-10-5,  
 Difluoromethane 75-15-0, Carbon disulfide, properties 75-18-3, Methyl  
 sulfide 75-19-4, Cyclopropane 75-21-8, Oxirane, properties 75-26-3  
 75-28-5, 2-Methylpropane 75-29-6, 2-Chloropropane 75-30-9,  
 2-Iodopropane 75-33-2, 2-Propanethiol 75-34-3, 1,1-Dichloroethane  
 75-35-4, properties 75-36-5, Acetyl chloride 75-37-6,

1,1-Difluoroethane 75-38-7 75-43-4, Dichlorofluoromethane 75-45-6,  
 Chlorodifluoromethane 75-46-7, Trifluoromethane 75-47-8,  
 Triiodomethane 75-50-3, properties 75-52-5, Nitromethane, properties  
 75-56-9, properties 75-64-9, tert-Butylamine, properties 75-65-0,  
 properties 75-66-1, 2-Methyl-2-propanethiol 75-69-4,  
 Trichlorofluoromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Carbon  
 tetrafluoride 75-83-2 75-85-4, tert-Pentyl alcohol 76-01-7,  
 Pentachloroethane 76-13-1 76-14-2, 1,2-Dichlorotetrafluoroethane  
 76-15-3 76-16-4, Hexafluoroethane 78-75-1, 1,2-Dibromopropane  
 78-76-2, 2-Bromobutane 78-78-4 78-79-5, properties 78-82-0,  
 Isobutyronitrile 78-86-4, 2-Chlorobutane 78-87-5, 1,2-Dichloropropane  
 78-92-2, sec-Butyl alcohol 78-93-3, 2-Butanone, properties 79-00-5,  
 1,1,2-Trichloroethane 79-01-6, Trichloroethene, properties 79-10-7,  
 2-Propenoic acid, properties 79-24-3 79-29-8 79-34-5,  
 1,1,2,2-Tetrachloroethane 79-46-9, 2-Nitropropane 86-89-5,  
 1-Pentyl-naphthalene 87-85-4, Hexamethylbenzene 90-12-0,  
 1-Methylnaphthalene 91-20-3, Naphthalene, properties 91-57-6,  
 2-Methylnaphthalene 92-52-4, 1,1'-Biphenyl, properties 93-22-1,  
 2-Pentyl-naphthalene 95-47-6, properties 95-48-7, properties 95-50-1,  
 o-Dichlorobenzene 95-63-6, 1,2,4-Trimethylbenzene 95-93-2,  
 1,2,4,5-Tetramethylbenzene 96-14-0, 3-Methylpentane 96-18-4 96-37-7,  
 Methylcyclopentane 98-08-8 98-82-8 98-83-9, properties 100-41-4,  
 Ethylbenzene, properties 100-42-5, properties 100-47-0, Benzonitrile,  
 properties 100-80-1, m-Methylstyrene 102-25-0, 1,3,5-Triethylbenzene  
 103-65-1, Propylbenzene 104-51-8, Butylbenzene 104-72-3,  
 1-Phenyldecane 105-05-5, p-Diethylbenzene 106-42-3, p-Xylene,  
 properties 106-44-5, properties 106-46-7 106-93-4, 1,2-Dibromoethane  
 106-94-5, 1-Bromopropane 106-95-6, 3-Bromo-1-propene, properties  
 106-97-8, Butane, properties 106-98-9, 1-Butene, properties 106-99-0,  
 1,3-Butadiene, properties 107-00-6, 1-Butyne 107-03-9, 1-Propanethiol  
 107-05-1 107-06-2, properties 107-08-4, 1-Iodopropane 107-10-8,  
 Propylamine, properties 107-12-0, Propionitrile 107-13-1,  
 2-Propenenitrile, properties 107-18-6, 2-Propen-1-ol, properties  
 107-21-1, 1,2-Ethanediol, properties 107-31-3 107-83-5,  
 2-Methylpentane 107-84-6, 1-Chloro-3-methylbutane 107-87-9,  
 2-Pentanone 108-03-2, 1-Nitropropane 108-08-7, 2,4-Dimethylpentane  
 108-20-3, Isopropyl ether 108-24-7 108-38-3, m-Xylene, properties  
 108-39-4, properties 108-67-8, Mesitylene, properties 108-86-1,  
 Bromobenzene, properties 108-87-2, Methylcyclohexane 108-88-3,  
 properties 108-90-7, properties 108-93-0, Cyclohexanol, properties  
 108-94-1, Cyclohexanone, properties 108-95-2, Phenol, properties  
 108-98-5, Benzenethiol, properties 108-99-6, 3-Picoline 109-06-8,  
 2-Picoline 109-65-9, 1-Bromobutane 109-66-0, Pentane, properties  
 109-67-1, 1-Pentene 109-69-3 109-73-9, 1-Butanamine, properties  
 109-74-0, Butyronitrile 109-79-5, 1-Butanethiol 109-89-7, properties  
 110-00-9, Furan 110-01-0, Thiacyclopentane 110-02-1, Thiophene  
 110-53-2, 1-Bromopentane 110-54-3, Hexane, properties 110-62-3,  
 Pentanal 110-66-7, 1-Pentanethiol 110-81-6, Ethyl disulfide  
 110-82-7, Cyclohexane, properties 110-83-8, Cyclohexene, properties  
 110-86-1, Pyridine, properties 111-27-3, Hexyl alcohol, properties  
 111-31-9, 1-Hexanethiol 111-43-3, Propyl ether 111-47-7, Propyl  
 sulfide 111-65-9, Octane, properties 111-66-0, 1-Octene 111-70-6,  
 Heptyl alcohol 111-71-7, Heptanal 111-84-2, Nonane 111-87-5,  
 1-Octanol, properties 111-88-6, 1-Octanethiol 112-30-1, Decyl alcohol  
 112-31-2, Decanal 112-40-3, Dodecane 112-41-4, 1-Dodecene 112-42-5,  
 Undecyl alcohol 112-51-6, Pentyl disulfide 112-53-8, 1-Dodecanol  
 112-55-0, 1-Dodecanethiol 112-70-9, 1-Tridecanol 112-72-1,  
 1-Tetradecanol 112-88-9, 1-Octadecene 112-92-5, 1-Octadecanol  
 112-95-8, Eicosane 115-07-1, 1-Propene, properties 115-10-6, Methyl  
 ether 115-25-3, Octafluorocyclobutane 116-14-3, properties 118-74-1,  
 Hexachlorobenzene 121-44-8, properties 123-01-3 123-02-4 123-38-6,  
 Propanal, properties 123-72-8, Butanal 123-75-1, Pyrrolidine,

properties 123-91-1, p-Dioxane, properties 124-11-8, 1-Nonene  
 124-13-0, Octanal 124-18-5, Decane 124-19-6, Nonanal 124-38-9,  
 Carbon dioxide, properties 124-40-3, properties 127-18-4,  
 Tetrachloroethene, properties 135-01-3, o-Diethylbenzene 141-78-6,  
 Acetic acid ethyl ester, properties 141-93-5, m-Diethylbenzene  
 142-28-9, 1,3-Dichloropropane 142-29-0, Cyclopentene 142-82-5,  
 Heptane, properties 142-96-1, Butyl ether 143-08-8, 1-Nonanol  
 143-10-2, 1-Decanethiol 151-56-4, Aziridine, properties 156-59-2,  
 cis-1,2-Dichloroethene 156-60-5, trans-1,2-Dichloroethene 157-40-4,  
 Spiropentane 275-51-4, Azulene 287-23-0, Cyclobutane 287-27-4,  
 Thiacyclobutane 287-92-3, Cyclopentane 291-64-5, Cycloheptane  
 RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
 PROC (Process)

(b.p. and critical temperature and f.p. and heat of evaporation of)  
 IT 292-64-8, Cyclooctane 352-32-9, p-Fluorotoluene 352-93-2, Ethylsulfide  
 353-36-6, Fluoroethane 359-11-5, Trifluoroethene 367-11-3,  
 o-Difluorobenzene 372-18-9, m-Difluorobenzene 392-56-3,  
 Hexafluorobenzene 420-12-2, Thiirane 420-26-8, 2-Fluoropropane  
 420-46-2, 1,1,1-Trifluoroethane 460-12-8, 1,3-Butadiene 460-13-9,  
 1-Fluoropropane 460-19-5, Cyanogen 462-06-6, Fluorobenzene 463-49-0,  
 1,2-Propadiene 463-51-4, Ketene 463-58-1, Carbonyl sulfide 463-82-1,  
 2,2-Dimethylpropane 464-06-2, 2,2,3-Trimethylbutane 488-23-3,  
 1,2,3,4-Tetramethylbenzene 493-01-6 493-02-7 503-17-3, 2-Butyne  
 507-09-5, Thioacetic acid, properties 507-19-7, 2-Bromo-2-methylpropane  
 507-20-0 513-35-9 513-36-0, 1-Chloro-2-methylpropane 513-44-0,  
 2-Methyl-1-propanethiol 513-53-1, 2-Butanethiol 526-73-8,  
 1,2,3-Trimethylbenzene 527-53-7, 1,2,3,5-Tetramethylbenzene 533-98-2,  
 1,2-Dibromobutane 536-74-3, Ethynylbenzene 538-68-1, Pentylbenzene  
 540-36-3, p-Difluorobenzene 540-54-5 540-67-0, Ethyl methyl ether  
 540-84-1, 2,2,4-Trimethylpentane 541-73-1, m-Dichlorobenzene 543-59-9,  
 1-Chloropentane 544-25-2, 1,3,5-Cycloheptatriene 544-40-1, Butyl  
 sulfide 544-76-3, Hexadecane 554-14-3, 2-Methylthiophene 556-56-9,  
 3-Iodo-1-propene 557-17-5, Methyl propyl ether 558-17-8,  
 2-Iodo-2-methylpropane 558-37-2 560-21-4, 2,3,3-Trimethylpentane  
 562-49-2, 3,3-Dimethylpentane 563-16-6, 3,3-Dimethylhexane 563-45-1,  
 3-Methyl-1-butene 563-46-2 563-78-0, 2,3-Dimethyl-1-butene 563-79-1  
 564-02-3, 2,2,3-Trimethylpentane 565-59-3, 2,3-Dimethylpentane  
 565-75-3, 2,3,4-Trimethylpentane 571-58-4, 1,4-Dimethylnaphthalene  
 571-61-9, 1,5-Dimethylnaphthalene 573-98-8, 1,2-Dimethylnaphthalene  
 575-37-1, 1,7-Dimethylnaphthalene 575-41-7, 1,3-Dimethylnaphthalene  
 575-43-9, 1,6-Dimethylnaphthalene 581-40-8, 2,3-Dimethylnaphthalene  
 581-42-0, 2,6-Dimethylnaphthalene 582-16-1, 2,7-Dimethylnaphthalene  
 583-48-2, 3,4-Dimethylhexane 584-94-1, 2,3-Dimethylhexane 589-34-4,  
 3-Methylhexane 589-43-5, 2,4-Dimethylhexane 589-53-7, 4-Methylheptane  
 589-81-1, 3-Methylheptane 590-18-1 590-19-2, 1,2-Butadiene 590-35-2,  
 2,2-Dimethylpentane 590-66-9, 1,1-Dimethylcyclohexane 590-73-8,  
 2,2-Dimethylhexane 591-50-4, Iodobenzene 591-76-4, 2-Methylhexane  
 591-93-5, 1,4-Pentadiene 591-95-7, 1,2-Pentadiene 591-96-8,  
 2,3-Pentadiene 592-13-2, 2,5-Dimethylhexane 592-27-8, 2-Methylheptane  
 592-41-6, 1-Hexene, properties 592-76-7, 1-Heptene 593-45-3,  
 Octadecane 593-53-3, Fluoromethane 593-60-2, Bromoethylene 593-70-4,  
 Chlorofluoromethane 594-20-7, 2,2-Dichloropropane 594-36-5,  
 2-Chloro-2-methylbutane 594-51-4, 2,3-Dibromo-2-methylbutane 594-82-1,  
 2,2,3,3-Tetramethylbutane 598-23-2, 3-Methyl-1-butene 598-25-4,  
 3-Methyl-1,2-butadiene 598-29-8, 1,2-Diiodopropane 598-53-8, Methyl  
 isopropyl ether 598-58-3, Methyl nitrate 600-22-4, 2-Nitrobutane  
 604-88-6, Hexaethylbenzene 605-01-6, Pentaethylbenzene 609-26-7,  
 3-Ethyl-2-methylpentane 611-14-3, o-Ethyltoluene 611-15-4 616-12-6  
 616-44-4, 3-Methylthiophene 617-78-7, 3-Ethylpentane 619-99-8,  
 3-Ethylhexane 620-14-4, m-Ethyltoluene 622-96-8, p-Ethyltoluene  
 622-97-9 624-29-3 624-64-6 624-73-7, 1,2-Diiodoethane 624-89-5,  
 Ethyl methyl sulfide 624-91-9, Methyl nitrite 624-92-0, Methyl

disulfide 625-27-4, 2-Methyl-2-pentene 625-58-1, Ethyl nitrate  
 625-80-9, Isopropyl sulfide 627-05-4, 1-Nitrobutane 627-13-4, Propyl  
 nitrate 627-19-0, 1-Pentyne 627-20-3 627-21-4, 2-Pentyne 628-29-5,  
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 629-45-8, Butyl disulfide 629-50-5, Tridecane 629-59-4, Tetradecane  
 629-62-9, Pentadecane 629-65-2, Heptyl sulfide 629-73-2, 1-Hexadecene  
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 1-Tetradecyne 765-13-9, 1-Pentadecyne 765-27-5, 1-Eicosyne 766-90-5  
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 1070-87-7, 2,2,4,4-Tetramethylpentane 1071-26-7, 2,2-Dimethylheptane  
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 1-Phenylheptane 1081-77-2 1120-21-4, Undecane 1120-36-1,  
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 1-Ethyl-naphthalene 1134-62-9, 2-Butyl-naphthalene 1186-53-4,  
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 1454-85-9, 1-Heptadecanol 1455-21-6, 1-Nonanethiol 1459-09-2,  
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 RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
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(b.p. and critical temperature and f.p. and heat of evaporation of)  
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 1-Cyclohexylnonane 2885-00-9, 1-Octadecanethiol  
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 3074-77-9, 3-Ethyl-4-methylhexane 3129-90-6, Isothiocyanic acid  
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 1-Cyclopentylundecane 6812-38-0, 1-Cyclohexylhexadecane 6812-39-1,  
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 14720-74-2, 2,2,4-Trimethylheptane 15869-80-4, 3-Ethylheptane  
 15869-85-9, 5-Methylnonane 15869-86-0, 4-Ethylhexane 15869-87-1,  
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 3-Ethyl-3-methylheptane 17302-02-2, 3,3-Diethylhexane 17302-04-4,  
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RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(b.p. and critical temperature and f.p. and heat of evaporation of)

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 AN 1989:581192 CAPLUS  
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 TI Critical properties of chemicals  
 AU Yaws, C. L.; Chen, D.; Yang, H. C.; Tan, L.; Nico, D.  
 CS Lamar Univ., Beaumont, TX, USA  
 SO Hydrocarbon Processing, International Edition (1989), 68(7), 61-4  
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 DT Journal  
 LA English  
 CC 65-6 (General Physical Chemistry)  
 AB The critical temps. and pressures and vols., f.p., normal b.p. critical compressibility and acentric factors are tabulated for 700 organic compds.  
 ST crit property org compd  
 IT Compression and Compressibility  
 (critical factor for, of chemical substances)  
 IT Boiling point  
 Freezing point  
 (of chemical substances)  
 IT Organic compounds, properties  
 RL: PRP (Properties)  
 (selected values for critical consts. for)  
 IT Critical constant  
 (pressure, of chemical substances, selected value for)

IT Critical constant  
(temperature, of chemical substances, selected value for)

IT Critical constant  
(volume, of chemical substances, selected value for)

IT 50-00-0, Formaldehyde, properties 56-23-5, Carbon tetrachloride, properties 60-29-7, Ethyl ether, properties 62-53-3, Aniline, properties 64-17-5, Ethyl alcohol, properties 64-18-6, Formic acid, properties 64-19-7, Acetic acid, properties 65-85-0, Benzoic acid, properties 66-25-1, Hexanal 67-56-1, Methanol, properties 67-63-0, Isopropyl alcohol, properties 67-64-1, Acetone, properties 67-66-3, Chloroform, properties 67-72-1, Hexachloroethane 71-23-8, Propyl alcohol, properties 71-36-3, Butyl alcohol, properties 71-41-0, Pentyl alcohol, properties 71-43-2, Benzene, properties 74-82-8, Methane, properties 74-83-9, Bromomethane, properties 74-84-0, Ethane, properties 74-85-1, Ethylene, properties 74-86-2, Ethyne, properties 74-87-3, Chloromethane, properties 74-88-4, Iodomethane, properties 74-89-5, Methylamine, properties 74-93-1, Methanethiol, properties 74-96-4, Bromoethane 74-98-6, Propane, properties 74-99-7, 1-Propyne 75-00-3, Chloroethane 75-01-4, Chloroethene, properties 75-02-5, Fluoroethane 75-03-6, Iodoethane 75-04-7, Ethylamine, properties 75-05-8, Acetonitrile, properties 75-07-0, Acetaldehyde, properties 75-08-1, Ethanethiol 75-09-2, Dichloromethane, properties 75-10-5, Difluoromethane 75-11-6, Diiodomethane 75-15-0, Carbon disulfide, properties 75-18-3, Methyl sulfide 75-19-4, Cyclopropane 75-21-8, Ethylene oxide, properties 75-26-3, 2-Bromopropane 75-28-5 75-29-6, 2-Chloropropane 75-30-9, 2-Iodopropane 75-33-2, 2-Propanethiol 75-34-3, 1,1-Dichloroethane 75-35-4, 1,1-Dichloroethene, properties 75-36-5, Acetyl chloride 75-37-6, 1,1-Difluoroethane 75-38-7, 1,1-Difluoroethene 75-43-4, Dichlorofluoromethane 75-45-6, Chlorodifluoromethane 75-46-7, Trifluoromethane 75-47-8, Triiodomethane 75-50-3, Trimethylamine, properties 75-52-5, Nitromethane, properties 75-56-9, Propylene oxide, properties 75-64-9, tert-Butylamine, properties 75-65-0, tert-Butyl alcohol, properties 75-66-1, 2-Methyl-2-propanethiol 75-69-4, Trichlorofluoromethane 75-71-8, Dichlorodifluoromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Carbon tetrafluoride 75-83-2, 2,2-Dimethylbutane 75-85-4, tert-Pentyl alcohol 76-01-7, Pentachloroethane 76-13-1, 1,1,2-Trichlorotrifluoroethane 76-14-2, 1,2-Dichlorotetrafluoroethane 76-15-3 76-16-4, Hexafluoroethane 78-75-1, 1,2-Dibromopropane 78-76-2, 2-Bromobutane 78-78-4 78-79-5, 2-Methyl-1,3-butadiene, properties 78-82-0, Isobutyronitrile 78-86-4, 2-Chlorobutane 78-87-5, 1,2-Dichloropropane 78-92-2, sec-Butyl alcohol 78-93-3, 2-Butanone, properties 79-00-5, 1,1,2-Trichloroethane 79-01-6, Trichloroethene, properties 79-10-7, Acrylic acid, properties 79-24-3, Nitroethane 79-29-8, 2,3-Dimethylbutane 79-34-5, 1,1,2,2-Tetrachloroethane 79-46-9, 2-Nitropropane 86-89-5, 1-Pentyl naphthalene 87-85-4, Hexamethylbenzene 90-12-0, 1-Methylnaphthalene 91-20-3, Naphthalene, properties 91-57-6, 2-Methylnaphthalene 92-52-4, Biphenyl, properties 93-22-1, 2-Pentyl naphthalene 95-47-6, o-Xylene, properties 95-48-7, o-Cresol, properties 95-50-1, o-Dichlorobenzene 95-63-6, 1,2,4-Trimethylbenzene 95-93-2, 1,2,4,5-Tetramethylbenzene 96-14-0, 3-Methylpentane 96-18-4, 1,2,3-Trichloropropane 96-37-7, Methylcyclopentane 98-08-8 98-82-8, Cumene 98-83-9,  $\alpha$ -Methylstyrene, properties 100-41-4, Ethylbenzene, properties 100-42-5, Styrene, properties 100-47-0, Benzonitrile, properties 100-80-1, m-Methylstyrene 102-25-0, 1,3,5-Triethylbenzene 103-65-1, Propylbenzene 104-51-8, Butylbenzene 104-72-3, 1-Phenyldecane 105-05-5, p-Diethylbenzene 106-42-3, p-Xylene, properties 106-44-5, p-Cresol, properties 106-46-7, p-Dichlorobenzene 106-93-4, 1,2-Dibromoethane 106-94-5, 1-Bromopropane 106-95-6, 3-Bromo-1-propene, properties 106-97-8, Butane, properties 106-98-9, 1-Butene, properties 106-99-0,



1,3-Butadiene, properties 107-00-6, 1-Butyne 107-03-9, 1-Propanethiol 107-05-1, 3-Chloro-1-propene 107-06-2, 1,2-Dichloroethane, properties 107-08-4, 1-Iodopropane 107-10-8, Propylamine, properties 107-12-0, Propionitrile 107-13-1, Acrylonitrile, properties 107-18-6, Allyl alcohol, properties 107-21-1, Ethylene glycol, properties 107-31-3, Methyl formate 107-83-5, 2-Methylpentane 107-84-6, 1-Chloro-3-methylbutane 107-87-9, 2-Pentanone 108-03-2, 1-Nitropropane 108-08-7, 2,4-Dimethylpentane 108-20-3, Isopropyl ether 108-24-7, Acetic anhydride 108-38-3, m-Xylene, properties 108-39-4, m-Cresol, properties 108-67-8, Mesitylene, properties 108-86-1, Bromobenzene, properties 108-87-2, Methylcyclohexane 108-88-3, Toluene, properties 108-90-7, Chlorobenzene, properties 108-93-0, Cyclohexanol, properties 108-94-1, Cyclohexanone, properties 108-95-2, Phenol, properties 108-98-5, Benzenethiol, properties 108-99-6, 3-Picoline 109-06-8, 2-Picoline 109-65-9, 1-Bromobutane 109-66-0, Pentane, properties 109-67-1, 1-Pentene 109-69-3, 1-Chlorobutane 109-73-9, Butylamine, properties 109-74-0, Butyronitrile 109-79-5, 1-Butanethiol 109-89-7, Diethylamine, properties 110-00-9, Furan 110-01-0, Thiacyclopentane 110-02-1, Thiophene 110-53-2, 1-Bromopentane 110-54-3, Hexane, properties 110-62-3, Valeraldehyde 110-66-7, 1-Pentanethiol 110-81-6, Ethyl disulfide 110-82-7, Cyclohexane, properties 110-83-8, Cyclohexene, properties 110-86-1, Pyridine, properties 111-27-3, Hexyl alcohol, properties 111-31-9, 1-Hexanethiol 111-43-3, Propyl ether 111-47-7, 111-65-9, Octane, properties 111-66-0, 1-Octene 111-70-6, Heptyl alcohol 111-71-7, Heptanal 111-84-2, Nonane 111-87-5, Octyl alcohol, properties 111-88-6, 1-Octanethiol 112-30-1, Decyl alcohol 112-31-2, Decanal 112-40-3, Dodecane 112-41-4, 1-Dodecene 112-42-5, Undecyl alcohol 112-51-6, Pentyl disulfide 112-53-8, Dodecyl alcohol 112-55-0, 1-Dodecanethiol 112-70-9, 1-Tridecanol 112-72-1, 1-Tetradecanol 112-88-9, 1-Octadecene 112-92-5, 1-Octadecanol 112-95-8, Eicosane 115-07-1, Propene, properties 115-10-6, Methyl ether 115-11-7, 2-Methylpropene, properties 115-25-3, Octafluorocyclobutane 116-14-3, Tetrafluoroethene, properties 118-74-1, Hexachlorobenzene 121-44-8, Triethylamine, properties 123-01-3, 1-Phenyldodecane 123-02-4, 1-Phenyltridecane 123-38-6, Propionaldehyde, properties 123-72-8, Butyraldehyde 123-75-1, Pyrrolidine, properties 123-91-1, p-Dioxane, properties 124-11-8, 1-Nonene 124-13-0, Octanal 124-18-5, Decane 124-19-6, Nonanal 124-38-9, Carbon dioxide, properties 124-40-3, Dimethylamine, properties 127-18-4, Tetrachloroethene, properties 135-01-3, o-Diethylbenzene 141-78-6, Ethyl acetate, properties 141-93-5, m-Diethylbenzene 142-28-9, 1,3-Dichloropropane 142-29-0, Cyclopentene 142-82-5, Heptane, properties 142-96-1, Butyl ether 143-08-8, Nonyl alcohol 143-10-2, 1-Decanethiol 151-56-4, Ethylenimine, properties 156-59-2, cis-1,2-Dichloroethene 156-60-5, trans-1,2-Dichloroethene 157-40-4, Spiropentane 275-51-4, Azulene 287-23-0, Cyclobutane 287-27-4, Thiacyclobutane 287-92-3, Cyclopentane

RL: PRP (Properties)

(critical consts. of, selected values for)

IT 291-64-5, Cycloheptane 292-64-8, Cyclooctane 352-32-9, p-Fluorotoluene 352-93-2, Ethylsulfide 353-36-6, Fluoroethane 359-11-5, Trifluoroethene 367-11-3, o-Difluorobenzene 372-18-9, m-Difluorobenzene 392-56-3, Hexafluorobenzene 420-12-2, Thiacyclopentane 420-26-8, 2-Fluoropropane 420-46-2, 1,1,1-Trifluoroethane 460-12-8, 1,3-Butadiene 460-13-9, 1-Fluoropropane 460-19-5, Cyanogen 462-06-6, Fluorobenzene 463-49-0, 1,2-Propadiene 463-51-4, Ketene 463-58-1, Carbonyl sulfide 463-82-1, 464-06-2, 2,2,3-Trimethylbutane 488-23-3, 1,2,3,4-Tetramethylbenzene 493-01-6, 493-02-7, 503-17-3, 2-Butyne 507-09-5, Thioacetic acid, properties 507-19-7, 2-Bromo-2-methylpropane 507-20-0, 2-Chloro-2-methylpropane 513-35-9, 2-Methyl-2-butene 513-36-0, 1-Chloro-2-methylpropane 513-44-0, 2-Methyl-1-propanethiol 513-53-1,

2-Butanethiol 526-73-8, 1,2,3-Trimethylbenzene 527-53-7,  
 1,2,3,5-Tetramethylbenzene 533-98-2, 1,2-Dibromobutane 536-74-3,  
 Ethynylbenzene 538-68-1, Pentylbenzene 540-36-3, p-Difluorobenzene  
 540-54-5, 1-Chloropropane 540-67-0, Ethyl methyl ether 540-84-1,  
 2,2,4-Trimethylpentane 541-73-1, m-Dichlorobenzene 543-59-9,  
 1-Chloropentane 544-25-2, 1,3,5-Cycloheptatriene 544-40-1, Butyl  
 sulfide 544-76-3, Hexadecane 554-14-3, 2-Methylthiophene 556-56-9,  
 3-Iodo-1-propene 557-17-5, Methyl propyl ether 558-17-8,  
 2-Iodo-2-methylpropane 558-37-2, 3,3-Dimethyl-1-butene 560-21-4,  
 2,3,3-Trimethylpentane 562-49-2, 3,3-Dimethylpentane 563-16-6,  
 3,3-Dimethylhexane 563-45-1, 3-Methyl-1-butene 563-46-2,  
 2-Methyl-1-butene 563-78-0, 2,3-Dimethyl-1-butene 563-79-1,  
 2,3-Dimethyl-2-butene 564-02-3, 2,2,3-Trimethylpentane 565-59-3,  
 2,3-Dimethylpentane 565-75-3, 2,3,4-Trimethylpentane 571-58-4,  
 1,4-Dimethylnaphthalene 571-61-9, 1,5-Dimethylnaphthalene 573-98-8,  
 1,2-Dimethylnaphthalene 575-37-1, 1,7-Dimethylnaphthalene 575-41-7,  
 1,3-Dimethylnaphthalene 575-43-9, 1,6-Dimethylnaphthalene 581-40-8,  
 2,3-Dimethylnaphthalene 581-42-0, 2,6-Dimethylnaphthalene 582-16-1,  
 2,7-Dimethylnaphthalene 583-48-2, 3,4-Dimethylhexane 584-94-1,  
 2,3-Dimethylhexane 589-34-4, 3-Methylhexane 589-43-5,  
 2,4-Dimethylhexane 589-53-7, 4-Methylheptane 589-81-1, 3-Methylheptane  
 590-18-1 590-19-2, 1,2-Butadiene 590-35-2, 2,2-Dimethylpentane  
 590-66-9, 1,1-Dimethylcyclohexane 590-73-8, 2,2-Dimethylhexane  
 591-50-4, Iodobenzene 591-76-4, 2-Methylhexane 591-93-5,  
 1,4-Pentadiene 591-95-7, 1,2-Pentadiene 591-96-8, 2,3-Pentadiene  
 592-13-2, 2,5-Dimethylhexane 592-27-8, 2-Methylheptane 592-41-6,  
 1-Hexene, properties 592-76-7, 1-Heptene 593-45-3, Octadecane  
 593-53-3, Fluoromethane 593-60-2, Bromoethylene 593-70-4,  
 Chlorofluoromethane 594-20-7, 2,2-Dichloropropane 594-36-5,  
 2-Chloro-2-methylbutane 594-51-4, 2,3-Dibromo-2-methylbutane 594-82-1,  
 2,2,3,3-Tetramethylbutane 598-23-2, 3-Methyl-1-butyne 598-25-4,  
 3-Methyl-1,2-butadiene 598-29-8, 1,2-Diiodopropane 598-53-8, Methyl  
 isopropyl ether 598-58-3, Methyl nitrate 600-24-8, 2-Nitrobutane  
 604-88-6, Hexaethylbenzene 605-01-6, Pentaethylbenzene 609-26-7,  
 3-Ethyl-2-methylpentane 611-14-3, o-Ethyltoluene 611-15-4,  
 o-Methylstyrene 616-12-6 616-44-4, 3-Methylthiophene 617-78-7,  
 3-Ethylpentane 619-99-8, 3-Ethylhexane 620-14-4, m-Ethyltoluene  
 622-96-8 622-97-9, p-Methylstyrene 624-29-3 624-64-6 624-73-7,  
 1,2-Diiodoethane 624-89-5, Ethyl methyl sulfide 624-91-9, Methyl  
 nitrite 624-92-0, Methyl disulfide 625-27-4, 2-Methyl-2-pentene  
 625-58-1, Ethyl nitrate 625-80-9, Isopropyl sulfide 627-05-4,  
 1-Nitrobutane 627-13-4, Propyl nitrate 627-19-0, 1-Pentyne 627-20-3  
 627-21-4, 2-Pentyne 628-29-5, Butyl methyl sulfide 628-71-7, 1-Heptyne  
 629-05-0, 1-Octyne 629-19-6, Propyl disulfide 629-20-9,  
 1,3,5,7-Cyclooctatetraene 629-45-8, Butyl disulfide 629-50-5,  
 Tridecane 629-59-4, Tetradecane 629-62-9, Pentadecane 629-65-2,  
 Heptyl sulfide 629-73-2, 1-Hexadecane 629-74-3, 1-Hexadecyne  
 629-76-5, 1-Pentadecanol 629-78-7, Heptadecane 629-89-0, 1-Octadecyne  
 629-92-5, Nonadecane 629-96-9, 1-Eicosanol 630-08-0, Carbon monoxide,  
 properties 635-81-4, 1,2,4,5-Tetraethylbenzene 638-04-0 638-46-0,  
 Butyl ethyl sulfide 642-32-0, 1,2,3,4-Tetraethylbenzene 646-04-8  
 674-76-0 689-97-4, 1-Buten-3-yne 691-37-2, 4-Methyl-1-pentene  
 691-38-3 693-02-7, 1-Hexyne 693-83-4, Decyl sulfide 693-89-0,  
 1-Methylcyclopentene 700-12-9, Pentamethylbenzene 760-20-3,  
 3-Methyl-1-pentene 760-21-4, 2-Ethyl-1-butene 763-29-1,  
 2-Methyl-1-pentene 764-93-2, 1-Decyne 765-03-7, 1-Dodecyne 765-10-6,  
 1-Tetradecyne 765-13-9, 1-Pentadecyne 765-27-5, 1-Eicosyne 766-90-5  
 821-95-4, 1-Undecene 822-27-5, Octyl disulfide 822-35-5, Cyclobutene  
 822-50-4 871-83-0, 2-Methylnonane 872-05-9, 1-Decene 872-10-6,  
 Pentyl sulfide 873-66-5 877-44-1, 1,2,4-Triethylbenzene 921-47-1,  
 2,3,4-Trimethylhexane 922-28-1, 3,4-Dimethylheptane 922-62-3  
 926-82-9, 3,5-Dimethylheptane 929-98-6, Nonyl sulfide 939-27-5,

2-Ethynaphthalene 1067-08-9, 3-Ethyl-3-methylpentane 1067-20-5,  
 3,3-Diethylpentane 1068-19-5, 4,4-Dimethylheptane 1068-87-7,  
 3-Ethyl-2,4-dimethylpentane 1069-53-0, 2,3,5-Trimethylhexane  
 1070-87-7, 2,2,4,4-Tetramethylpentane 1071-26-7, 2,2-Dimethylheptane  
 1071-81-4, 2,2,5,5-Tetramethylhexane 1072-05-5, 2,6-Dimethylheptane  
 1072-16-8, 2,7-Dimethyloctane 1077-16-3, Hexylbenzene 1078-71-3,  
 1-Phenylheptane 1081-77-2, 1-Phenylnonane 1120-21-4, Undecane  
 1120-36-1, 1-Tetradecene 1120-62-3, 3-Methylcyclopentene 1127-76-0,  
 1-Ethynaphthalene 1134-62-9, 2-Butynaphthalene 1186-53-4,  
 2,2,3,4-Tetramethylpentane 1189-99-7, 2,5,5-Trimethylheptane  
 1190-83-6, 2,2,6-Trimethylheptane 1192-18-3 1454-84-8, 1-Nonadecanol  
 1454-85-9, 1-Heptadecanol 1455-21-6, 1-Nonanethiol 1459-09-2,  
 1-Phenylhexadecane 1459-10-5, 1-Phenyltetradecane 1551-21-9, Isopropyl  
 methyl sulfide 1574-41-0 1613-46-3, Butyl propyl sulfide 1613-51-0,  
 Thiacyclohexane 1630-77-9, cis-1,2-Difluoroethene 1630-78-0,  
 trans-1,2-Difluoroethene 1634-04-4, Methyl-tert-butyl ether 1634-09-9,  
 1-Butynaphthalene 1638-26-2, 1,1-Dimethylcyclopentane 1639-09-4,  
 1-Heptanethiol 1640-89-7, Ethylcyclopentane 1678-91-7,  
 Ethylcyclohexane 1678-92-8, Propylcyclohexane 1678-93-9,  
 Butylcyclohexane 1679-07-8, Cyclopentanethiol 1679-09-0,  
 2-Methyl-2-butanethiol 1712-64-7, Isopropyl nitrate 1741-83-9, Methyl  
 pentyl sulfide 1759-58-6 1759-81-5, 4-Methylcyclopentane 1795-15-9,  
 1-Cyclohexyloctane 1795-16-0, 1-Cyclohexyldecane 1795-17-1,  
 1-Cyclohexyldodecane 1795-18-2, 1-Cyclohexyltetradecane 1795-20-6  
 1795-21-7, 1-Cyclopentyldecane 1795-22-8, 1-Cyclopentyltetradecane  
 RL: PRP (Properties)

(critical consts. of, selected values for)

IT 1795-26-2 1795-27-3 2004-70-8 2027-19-2, 2-Propynaphthalene  
 2040-95-1, Butylcyclopentane 2040-96-2, Propylcyclopentane 2051-30-1,  
 2,6-Dimethyloctane 2074-87-5, Cyanogen 2079-95-0, 1-Tetradecanethiol  
 2131-18-2, 1-Phenylpentadecane 2189-60-8, 1-Phenyloctane 2207-01-4  
 2207-03-6 2207-04-7 2213-23-2, 2,4-Dimethylheptane 2216-30-0,  
 2,5-Dimethylheptane 2216-32-2, 4-Ethylheptane 2216-33-3,  
 3-Methyloctane 2216-34-4, 4-Methyloctane 2243-98-3, 1-Undecyne  
 2437-56-1, 1-Tridecene 2532-58-3 2613-61-8, 2,4,6-Trimethylheptane  
 2690-08-6, Octyl sulfide 2765-18-6, 1-Propynaphthalene 2851-83-4,  
 Dodecyl ethyl sulfide 2882-98-6, 1-Cyclopentylnonane 2883-02-5,  
 1-Cyclohexylnonane 2885-00-9, 1-Octadecanethiol  
 2917-26-2, 1-Hexadecanethiol 3074-71-3 3074-75-7,  
 4-Ethyl-2-methylhexane 3074-76-8, 3-Ethyl-3-methylhexane 3074-77-9,  
 3-Ethyl-4-methylhexane 3129-90-6, Isothiocyanic acid 3178-29-8,  
 4-Propylheptane 3221-61-2, 2-Methyloctane 3452-07-1, 1-Eicosene  
 3452-09-3, 1-Nonyne 3522-94-9, 2,2,5-Trimethylhexane 3698-89-3,  
 Dodecyl methyl sulfide 3698-93-9, Octyl propyl sulfide 3698-94-0,  
 Ethyl octyl sulfide 3698-95-1, Methyl octyl sulfide 3741-00-2  
 3877-15-4, Methyl propyl sulfide 4032-86-4, 3,3-Dimethylheptane  
 4032-92-2, 2,4,4-Trimethylheptane 4032-93-3, 2,3,6-Trimethylheptane  
 4032-94-4, 2,4-Dimethyloctane 4050-45-7 4110-44-5, 3,3-Dimethyloctane  
 4110-50-3, Ethyl propyl sulfide 4292-75-5, 1-Cyclohexylhexane  
 4292-92-6, Pentylcyclohexane 4457-00-5 4485-77-2, Nonyl disulfide  
 4669-01-6, 1-Cyclopentylpentadecane 4753-80-4, Thiacycloheptane  
 5171-84-6, 3,3,4,4-Tetramethylhexane 5332-52-5, 1-Undecanethiol  
 5408-86-6, 2,3-Dibromobutane 5617-41-4 5617-42-5, 1-Cyclopentylheptane  
 5634-30-0, 1-Cyclopentyldecane 5881-17-4, 3-Ethyloctane 5911-04-6,  
 3-Methylnonane 6006-33-3, 1-Cyclohexyltridecane 6006-34-4,  
 1-Cyclopentyltridecane 6006-95-7, 1-Cyclohexylpentadecane 6163-66-2,  
 tert-Butyl ether 6294-31-1, Hexyl sulfide 6742-54-7, 1-Phenylundecane  
 6765-39-5, 1-Heptadecene 6785-23-5, 1-Cyclopentylundecane 6812-38-0,  
 1-Cyclohexylhexadecane 6812-39-1, 1-Cyclopentylhexadecane 6863-58-7,  
 sec-Butyl ether 6876-18-2, 3-Isopropyl-2-methylhexane 6876-23-9  
 7146-60-3, 2,3-Dimethyloctane 7154-79-2, 2,2,3,3-Tetramethylpentane  
 7154-80-5, 3,3,5-Trimethylheptane 7220-26-0, 3-Ethyl-2,4-dimethylhexane

7289-44-3, Methyl undecyl sulfide 7289-45-4, Methyl tetradecyl sulfide  
 7309-44-6, Ethyl hexyl sulfide 7372-86-3, 2-Ethyl-6-methylnaphthalene  
 7642-09-3 7688-21-3 10496-15-8, Hexyl disulfide 10496-16-9, Heptyl  
 disulfide 10496-18-1, Decyl disulfide 13269-52-8 13360-61-7,  
 1-Pentadecene 13373-97-2, 1-Eicosanethiol 13475-78-0,  
 5-Ethyl-2-methylheptane 13475-79-1, 2,4-Dimethyl-3-isopropylpentane  
 13475-81-5, 2,2,3,3-Tetramethylhexane 13952-84-6, sec-Butylamine  
 14676-29-0, 3-Ethyl-2-methylheptane 14720-74-2, 2,2,4-Trimethylheptane  
 15869-80-4, 3-Ethylheptane 15869-85-9, 5-Methylnonane 15869-86-0,  
 4-Ethylhexane 15869-87-1, 2,2-Dimethyloctane 15869-89-3,  
 2,5-Dimethyloctane 15869-92-8, 3,4-Dimethyloctane 15869-93-9,  
 3,5-Dimethyloctane 15869-94-0, 3,6-Dimethyloctane 15869-95-1,  
 4,4-Dimethyloctane 15869-96-2, 4,5-Dimethyloctane 16747-25-4,  
 2,2,3-Trimethylhexane 16747-26-5, 2,2,4-Trimethylhexane 16747-28-7,  
 2,3,3-Trimethylhexane 16747-30-1, 2,4,4-Trimethylhexane 16747-31-2,  
 3,3,4-Trimethylhexane 16747-32-3, 3-Ethyl-2,2-dimethylpentane  
 16747-33-4, 3-Ethyl-2,3-dimethylpentane 16747-38-9,  
 2,3,3,4-Tetramethylpentane 16747-42-5, 2,2,4,5-Tetramethylhexane  
 16747-44-7, 2,2,3,3,4-Pentamethylpentane 16747-45-8,  
 2,2,3,4-Pentamethylpentane 16789-46-1, 3-Ethyl-2-methylhexane  
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 20278-85-7, 2,3,5-Trimethylheptane 20278-87-9, 3,3,4-Trimethylheptane  
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 20291-60-5, Hexyl methyl sulfide 20291-61-6, Heptyl methyl sulfide  
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 52896-95-4, 2,3,4-Trimethylheptane 52896-99-8,  
 4-Ethyl-2,2-dimethylhexane 52897-00-4, 3-Ethyl-2,3-dimethylhexane  
 52897-01-5, 4-Ethyl-2,3-dimethylhexane 52897-03-7,  
 4-Ethyl-2,4-dimethylhexane 52897-04-8, 3-Ethyl-2,5-dimethylhexane  
 52897-05-9, 4-Ethyl-3,3-dimethylhexane 52897-06-0,  
 3-Ethyl-3,4-dimethylhexane 52897-08-2, 2,2,3,4-Tetramethylhexane  
 52897-09-3, 2,2,3,5-Tetramethylhexane 52897-10-6,  
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 52897-12-8, 2,3,4,4-Tetramethylhexane 52897-15-1,  
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 52897-17-3, 3-Ethyl-2,2,3-trimethylpentane 52897-18-4,  
 3-Ethyl-2,2,4-trimethylpentane 52897-19-5,  
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 59973-08-9, Ethyl nonyl sulfide 62103-66-6, Nonyl propyl sulfide

62155-09-3, Methyl tridecyl sulfide 62155-10-6, Methyl pentadecyl sulfide 62155-11-7, Heptadecyl methyl sulfide 62155-12-8, Methyl nonadecyl sulfide 64919-20-6, Ethyl pentadecyl sulfide 66271-54-3, Ethyl tetradecyl sulfide 66271-55-4, Propyl tridecyl sulfide 66271-81-6, Ethyl tridecyl sulfide 66271-82-7, Dodecyl propyl sulfide 66271-83-8, Butyl undecyl sulfide 66292-31-7, Ethyl hexadecyl sulfide 66292-32-8, Pentadecyl propyl sulfide 66292-33-9, Butyl tetradecyl sulfide 66359-40-8, Ethyl heptadecyl sulfide 66359-41-9, Hexadecyl propyl sulfide 66359-42-0, Butyl pentadecyl sulfide 66455-35-4, Heptadecyl propyl sulfide 66577-30-8, Ethyl undecyl sulfide 66577-31-9, Decyl propyl sulfide 66577-32-0, Butyl nonyl sulfide 66577-61-5, Propyl tetradecyl sulfide 66577-62-6, Butyl tridecyl sulfide 66826-84-4, Propyl undecyl sulfide  
 RL: PRP (Properties)  
 (critical consts. of, selected values for)

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TI Enthalpy of formation for 700 major organic compounds

AU Yaws, Carl L.; Chiang, P. Y.

CS Lamar Univ., Beaumont, TX, USA

SO Chemical Engineering (New York, NY, United States) (1988), 95(13), 81-8  
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DT Journal

LA English

CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)

AB A correlation method for the ideal-gas heat of formation as function of temperature was applied and values were calculated for 700 organic compds.  
 The calculated

values were compared to the exptl. data and an average deviation of 0.2 kJ/mol was found. Consts. for the correlation equation,  $\Delta H_f = A + BT + CT^2$ , with  $\Delta H_f$  in kJ/mol and T in °K, are tabulated for 700 compds. Values at 298 K are also listed.

ST heat formation org compd ideal gas

IT Heat of formation

(calcn. of, of organic compds. in ideal gas state, equation for)

IT Organic compounds, properties

RL: PRP (Properties); FORM (Formation, nonpreparative)

(heats of formation of, in ideal gas state, equation for calcn. of)

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 110-81-6, Ethyl disulfide 110-82-7, Cyclohexane, properties 110-83-8,  
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 112-30-1, Decyl alcohol 112-31-2, Decanal 112-40-3, Dodecane

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RL: PRP (Properties)

(heat of formation of, in ideal gas state, equation for calcn. of)

IT 291-64-5, Cycloheptane 292-64-8, Cyclooctane 352-32-9, p-Fluorotoluene 352-93-2, Ethylsulfide 353-36-6, Fluoroethane 359-11-5, Trifluoroethene 367-11-3, o-Difluorobenzene 372-18-9, m-Difluorobenzene 392-56-3, Hexafluorobenzene 420-12-2, Thiacyclopentane 420-26-8, 2-Fluoropropane 420-46-2, 1,1,1-Trifluoroethane 460-12-8, 1,3-Butadiene 460-13-9, 1-Fluoropropane 460-19-5, Cyanogen 462-06-6, Fluorobenzene 463-49-0, 1,2-Propadiene 463-51-4, Ketene 463-58-1, Carbonyl sulfide 463-82-1 464-06-2, 2,2,3-Trimethylbutane 488-23-3, 1,2,3,4-Tetramethylbenzene 493-01-6, Decahydronaphthalene, cis 493-02-7, Decahydronaphthalene, trans 503-17-3, 2-Butyne 507-09-5, Thioacetic acid, properties 507-19-7, 2-Bromo-2-methylpropane 507-20-0, 2-Chloro-2-methylpropane 513-35-9, 2-Methyl-2-butene 513-36-0, 1-Chloro-2-methylpropane 513-44-0, 2-Methyl-1-propanethiol 513-53-1, 2-Butanethiol 526-73-8, 1,2,3-Trimethylbenzene 527-53-7, 1,2,3,5-Tetramethylbenzene 533-98-2, 1,2-Dibromobutane 536-74-3, Ethynylbenzene 538-68-1, Pentylbenzene 540-36-3, p-Difluorobenzene 540-54-5, 1-Chloropropane 540-67-0, Ethyl methyl ether 540-84-1, 2,2,4-Trimethylpentane 541-73-1, m-Dichlorobenzene 543-59-9, 1-Chloropentane 544-25-2, 1,3,5-Cycloheptatriene 544-40-1, Butyl sulfide 544-76-3, Hexadecane 554-14-3, 2-Methylthiophene 556-56-9 557-17-5, Methyl propyl ether 558-17-8, 2-Iodo-2-methylpropane 558-37-2, 3,3-Dimethyl-1-butene 560-21-4, 2,3,3-Trimethylpentane 562-49-2, 3,3-Dimethylpentane 563-16-6, 3,3-Dimethylhexane 563-45-1, 3-Methyl-1-butene 563-46-2, 2-Methyl-1-butene 563-78-0, 2,3-Dimethyl-1-butene 563-79-1, 2,3-Dimethyl-2-butene 564-02-3, 2,2,3-Trimethylpentane 565-59-3, 2,3-Dimethylpentane 565-75-3, 2,3,4-Trimethylpentane 571-58-4, 1,4-Dimethylnaphthalene 571-61-9, 1,5-Dimethylnaphthalene 573-98-8, 1,2-Dimethylnaphthalene 575-37-1, 1,7-Dimethylnaphthalene 575-41-7, 1,3-Dimethylnaphthalene 575-43-9, 1,6-Dimethylnaphthalene 581-40-8, 2,3-Dimethylnaphthalene 581-42-0, 2,6-Dimethylnaphthalene 582-16-1, 2,7-Dimethylnaphthalene 583-48-2, 3,4-Dimethylhexane 584-94-1, 2,3-Dimethylhexane 589-34-4, 3-Methylhexane 589-43-5, 2,4-Dimethylhexane 589-53-7, 4-Methylheptane 589-81-1, 3-Methylheptane 590-18-1 590-19-2, 1,2-Butadiene 590-35-2, 2,2-Dimethylpentane 590-66-9, 1,1-Dimethylcyclohexane 590-73-8, 2,2-Dimethylhexane 591-50-4, Iodobenzene 591-76-4, 2-Methylhexane 591-93-5, 1,4-Pentadiene 591-95-7, 1,2-Pentadiene 591-96-8, 2,3-Pentadiene 592-13-2, 2,5-Dimethylhexane 592-27-8, 2-Methylheptane 592-41-6, 1-Hexene, properties 592-76-7, 1-Heptene 593-45-3, Octadecane

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 Pentaethylbenzene 609-26-7, 3-Ethyl-2-methylpentane 611-14-3,  
 o-Ethyltoluene 611-15-4, o-Methylstyrene 616-12-6,  
 3-Methyl-2-pentene,trans 616-44-4, 3-Methylthiophene 617-78-7,  
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 629-78-7, Heptadecane 629-89-0, 1-Octadecyne 629-92-5, Nonadecane  
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 Thiacyclohexane 1630-77-9, cis-1,2-Difluoroethene 1630-78-0,  
 trans-1,2-Difluoroethene 1634-04-4, Methyl tert-butyl ether 1634-09-9,  
 1-Butyl-naphthalene 1638-26-2, 1,1-Dimethylcyclopentane 1639-09-4,  
 1-Heptanethiol 1640-89-7, Ethylcyclopentane 1678-91-7,  
 Ethylcyclohexane 1678-92-8, Propylcyclohexane 1678-93-9,  
 Butylcyclohexane 1679-07-8, Cyclopentanethiol 1679-09-0,  
 2-Methyl-2-butanethiol 1712-64-7, Isopropyl nitrate 1741-83-9, Methyl  
 pentyl sulfide 1759-58-6 1759-81-5, 4-Methylcyclopentene 1795-15-9,  
 1-Cyclohexyloctane 1795-16-0, 1-Cyclohexyldecane 1795-17-1,  
 1-Cyclohexyldodecane 1795-18-2, 1-Cyclohexyltetradecane 1795-20-6  
 1795-21-7, 1-Cyclopentyldecane 1795-22-8, 1-Cyclopentyltetradecane  
 RL: PRP (Properties)  
 (heat of formation of, in ideal gas state, equation for calcn. of)



IT 1795-26-2 1795-27-3 2004-70-8 2027-19-2, 2-Propylnaphthalene  
 2040-95-1, Butylcyclopentane 2040-96-2, Propylcyclopentane 2051-30-1,  
 2,6-Dimethyloctane 2079-95-0, 1-Tetradecanethiol 2131-18-2,  
 1-Phenylpentadecane 2189-60-8, 1-Phenylloctane 2207-01-4 2207-03-6  
 2207-04-7 2213-23-2, 2,4-Dimethylheptane 2216-30-0,  
 2,5-Dimethylheptane 2216-32-2, 4-Ethylheptane 2216-33-3,  
 3-Methyloctane 2216-34-4, 4-Methyloctane 2243-98-3, 1-Undecyne  
 2437-56-1, 1-Tridecene 2532-58-3 2613-61-8, 2,4,6-Trimethylheptane  
 2690-08-6, Octyl sulfide 2765-18-6, 1-Propylnaphthalene 2851-83-4,  
 Dodecyl ethyl sulfide 2882-98-6, 1-Cyclopentylnonane 2883-02-5,  
 1-Cyclohexylnonane 2885-00-9, 1-Octadecanethiol  
 2917-26-2, 1-Hexadecanethiol 3074-71-3, 2,3-Dimethylheptane  
 3074-75-7, 4-Ethyl-2-methylhexane 3074-76-8, 3-Ethyl-3-methylhexane  
 3074-77-9, 3-Ethyl-4-methylhexane 3129-90-6, Isothiocyanic acid  
 3178-29-8, 4-Propylheptane 3221-61-2, 2-Methyloctane 3452-07-1,  
 1-Eicosene 3452-09-3, 1-Nonyne 3522-94-9, 2,2,5-Trimethylhexane  
 3698-89-3, Dodecyl methyl sulfide 3698-93-9, Octyl propyl sulfide  
 3698-94-0, Ethyl octyl sulfide 3698-95-1, Methyl octyl sulfide  
 3741-00-2 3877-15-4, Methyl propyl sulfide 4032-86-4,  
 3,3-Dimethylheptane 4032-92-2, 2,4,4-Trimethylheptane 4032-93-3,  
 2,3,6-Trimethylheptane 4032-94-4, 2,4-Dimethyloctane 4050-45-7,  
 2-Hexene,trans 4110-44-5, 3,3-Dimethyloctane 4110-50-3, Ethyl propyl  
 sulfide 4292-75-5, 1-Cyclohexylhexane 4292-92-6 4485-77-2, Nonyl  
 disulfide 4669-01-6, 1-Cyclopentylpentadecane 4753-80-4,  
 Thiacycloheptane 5171-84-6, 3,3,4,4-Tetramethylhexane 5332-52-5,  
 1-Undecanethiol 5408-86-6, 2,3-Dibromobutane 5617-41-4 5617-42-5,  
 1-Cyclopentylheptane 5634-30-0, 1-Cyclopentyldecane 5881-17-4,  
 3-Ethyloctane 5911-04-6, 3-Methylnonane 6006-33-3,  
 1-Cyclohexyltridecane 6006-34-4, 1-Cyclopentyltridecane 6006-95-7,  
 1-Cyclohexylpentadecane 6163-66-2, tert-Butyl ether 6294-31-1, Hexyl  
 sulfide 6742-54-7, 1-Phenylundecane 6765-39-5, 1-Heptadecene  
 6785-23-5, 1-Cyclopentylundecane 6812-38-0, 1-Cyclohexylhexadecane  
 6812-39-1, 1-Cyclopentylhexadecane 6863-58-7, sec-Butyl ether  
 6876-18-2, 3-Isopropyl-2-methylhexane 6876-23-9 7146-60-3,  
 2,3-Dimethyloctane 7154-79-2 7154-80-5, 3,3,5-Trimethylheptane  
 7220-26-0, 3-Ethyl-2,4-dimethylhexane 7289-44-3, Methyl undecyl sulfide  
 7289-45-4, Methyl tetradecyl sulfide 7309-44-6, Ethyl hexyl sulfide  
 7372-86-3, 2-Ethyl-6-methylnaphthalene 7642-09-3, 3-Hexene,cis  
 7688-21-3 10496-15-8, Hexyl disulfide 10496-16-9, Heptyl disulfide  
 10496-18-1, Decyl disulfide 13269-52-8, 3-Hexene,trans 13360-61-7,  
 1-Pentadecene 13373-97-2, 1-Eicosanethiol 13475-78-0,  
 5-Ethyl-2-methylheptane 13475-79-1, 2,4-Dimethyl-3-isopropylpentane  
 13475-81-5, 2,2,3,3-Tetramethylhexane 13952-84-6, sec-Butylamine  
 14676-29-0, 3-Ethyl-2-methylheptane 14720-74-2, 2,2,4-Trimethylheptane  
 15869-80-4, 3-Ethylheptane 15869-85-9, 5-Methylnonane 15869-86-0,  
 4-Ethyloctane 15869-87-1, 2,2-Dimethyloctane 15869-89-3,  
 2,5-Dimethyloctane 15869-92-8, 3,4-Dimethyloctane 15869-93-9,  
 3,5-Dimethyloctane 15869-94-0, 3,6-Dimethyloctane 15869-95-1,  
 4,4-Dimethyloctane 15869-96-2, 4,5-Dimethyloctane 16747-25-4,  
 2,2,3-Trimethylhexane 16747-26-5, 2,2,4-Trimethylhexane 16747-28-7,  
 2,3,3-Trimethylhexane 16747-30-1, 2,4,4-Trimethylhexane 16747-31-2,  
 3,3,4-Trimethylhexane 16747-32-3, 3-Ethyl-2,2-dimethylpentane  
 16747-33-4, 3-Ethyl-2,3-dimethylpentane 16747-38-9,  
 2,3,3,4-Tetramethylpentane 16747-42-5, 2,2,4,5-Tetramethylhexane  
 16747-44-7, 2,2,3,3,4-Pentamethylpentane 16747-45-8,  
 2,2,3,4-Pentamethylpentane 16789-46-1, 3-Ethyl-2-methylhexane  
 16900-07-5, Butyl octyl sulfide 16900-08-6, Butyl dodecyl sulfide  
 16967-04-7, Butyl hexyl sulfide 17059-55-1, 2-Ethyl-7-methylnaphthalene  
 17301-94-9, 4-Methylnonane 17302-01-1, 3-Ethyl-3-methylheptane  
 17302-02-2, 3,3-Diethylhexane 17302-04-4, 4-Ethyl-4-methylheptane  
 17348-59-3, Isopropyl tert-butyl ether 18435-45-5, 1-Nonadecene  
 18437-89-3, Butyl hexadecyl sulfide 19313-57-6, Butyl decyl sulfide

19313-61-2, Decyl ethyl sulfide 19398-77-7, 3,4-Diethylhexane  
 19484-26-5, 1-Tridecanethiol 20278-84-6, 2,4,5-Trimethylheptane  
 20278-85-7, 2,3,5-Trimethylheptane 20278-87-9, 3,3,4-Trimethylheptane  
 20278-88-0, 3,4,4-Trimethylheptane 20291-60-5, Hexyl methyl sulfide  
 20291-61-6, Heptyl methyl sulfide 20291-91-2, 3-Ethyl-2,2-dimethylhexane  
 20291-95-6, 2,2,5-Trimethylheptane 22438-39-7, Decyl methyl sulfide  
 24768-42-1, Butyl pentyl sulfide 24768-43-2, Hexyl propyl sulfide  
 24768-44-3, Ethyl heptyl sulfide 24768-46-5, Heptyl propyl sulfide  
 25276-70-4, 1-Pentadecanethiol 26158-99-6, Ethyl pentyl sulfide  
 26186-00-5, 1-Heptadecyne 26186-01-6, 1-Nonadecyne 26186-02-7,  
 1-Tridecane 27563-68-4, Hexadecyl methyl sulfide 31032-94-7,  
 2-Ethyl-3-methylnaphthalene 36653-82-4, 1-Hexadecanol 38842-05-6,  
 1,2,3,5-Tetraethylbenzene 40289-98-3, Methyl octadecyl sulfide  
 40813-84-1, Butyl heptyl sulfide 41947-84-6, Ethyl octadecyl sulfide  
 42205-08-3 42841-80-5, Pentyl propyl sulfide 51750-65-3,  
 2,2,4,4-Tetramethylhexane 52896-87-4, 4-Isopropylheptane 52896-88-5,  
 4-Ethyl-2-methylheptane 52896-89-6, 4-Ethyl-3-methylheptane  
 52896-90-9, 3-Ethyl-5-methylheptane 52896-91-0, 3-Ethyl-4-methylheptane  
 52896-92-1, 2,2,3-Trimethylheptane 52896-93-2, 2,3,3-Trimethylheptane  
 52896-95-4, 2,3,4-Trimethylheptane 52896-99-8,  
 4-Ethyl-2,2-dimethylhexane 52897-00-4, 3-Ethyl-2,3-dimethylhexane  
 52897-01-5, 4-Ethyl-2,3-dimethylhexane 52897-03-7,  
 4-Ethyl-2,4-dimethylhexane 52897-04-8, 3-Ethyl-2,5-dimethylhexane  
 52897-05-9, 4-Ethyl-3,3-dimethylhexane 52897-06-0,  
 3-Ethyl-3,4-dimethylhexane 52897-08-2, 2,2,3,4-Tetramethylhexane  
 52897-09-3, 2,2,3,5-Tetramethylhexane 52897-10-6,  
 2,3,3,4-Tetramethylhexane 52897-11-7, 2,3,3,5-Tetramethylhexane  
 52897-12-8, 2,3,4,4-Tetramethylhexane 52897-15-1,  
 2,3,4,5-Tetramethylhexane 52897-16-2, 3,3-Diethyl-2-methylpentane  
 52897-17-3, 3-Ethyl-2,2,3-trimethylpentane 52897-18-4,  
 3-Ethyl-2,2,4-trimethylpentane 52897-19-5,  
 3-Ethyl-2,3,4-trimethylpentane 53161-72-1, 1,2-Diiodobutane  
 53193-22-9, 1-Heptadecanethiol 53193-23-0, 1-Nonadecanethiol  
 54105-66-7, 1-Cyclohexylundecane 59973-07-8, Methyl nonyl sulfide  
 59973-08-9, Ethyl nonyl sulfide 62103-66-6, Nonyl propyl sulfide  
 62155-09-3, Methyl tridecyl sulfide 62155-10-6, Methyl pentadecyl  
 sulfide 62155-11-7, Heptadecyl methyl sulfide 62155-12-8, Methyl  
 nonadecyl sulfide 64919-20-6, Ethyl pentadecyl sulfide 66271-54-3,  
 Ethyl tetradecyl sulfide 66271-55-4, Propyl tridecyl sulfide  
 66271-81-6, Ethyl tridecyl sulfide 66271-82-7, Dodecyl propyl sulfide  
 66271-83-8, Butyl undecyl sulfide 66292-31-7, Ethyl hexadecyl sulfide  
 66292-32-8, Pentadecyl propyl sulfide 66292-33-9, Butyl tetradecyl  
 sulfide 66359-40-8, Ethyl heptadecyl sulfide 66359-41-9, Hexadecyl  
 propyl sulfide 66359-42-0, Butyl pentadecyl sulfide 66455-35-4,  
 Heptadecyl propyl sulfide 66577-30-8, Ethyl undecyl sulfide  
 66577-31-9, Decyl propyl sulfide 66577-32-0, Butyl nonyl sulfide  
 66577-61-5, Propyl tetradecyl sulfide 66577-62-6, Butyl tridecyl sulfide  
 66826-84-4, Propyl undecyl sulfide  
 RL: PRP (Properties)  
 (heat of formation of, in ideal gas state, equation for calcn. of)

L23 ANSWER 7 OF 10 CAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1988:428388 CAPLUS  
 DN 109:28388  
 OREF 109:4739a,4742a  
 ED Entered STN: 22 Jul 1988  
 TI Heat capacities for 700 compounds  
 AU Yaws, Carl L.; Ni, H. M.; Chiang, P. Y.  
 CS Lamar Univ., Beaumont, TX, USA  
 SO Chemical Engineering (New York, NY, United States) (1988), 95(7), 91-8  
 CODEN: CHEEA3; ISSN: 0009-2460  
 DT Journal

LA English  
 CC 69-2 (Thermodynamics, Thermochemistry, and Thermal Properties)  
 AB Consts. (A, B, C, D) for the correlation equation  $C_p = A + B + T + C + T^2 + D + T^3$  (where  $C_p$  is the heat capacity in J/mol. K and T is the temperature in K) are tabulated for (mostly) 700 organic compds. The consts. were obtained by applying a generalized least-squares computer program to data found in the literature. The average deviation claimed for the calculated values (from the original data) is 0.15%.

ST heat capacity org compd equation  
 IT Heat capacity  
 (calcn. of, of chemical compds., equation for)

IT Organic compounds, properties  
 RL: PRP (Properties)  
 (heat capacities of, calcn. of)

IT 50-00-0, Formaldehyde, properties 56-23-5, Carbon tetrachloride, properties 60-29-7, Ethyl ether, properties 62-53-3, Aniline, properties 64-17-5, Ethyl alcohol, properties 64-18-6, Formic acid, properties 64-19-7, Acetic acid, properties 65-85-0, Benzoic acid, properties 66-25-1, Hexanal 67-56-1, Methanol, properties 67-63-0, 2-Propanol, properties 67-64-1, Acetone, properties 67-66-3, properties 67-72-1, Hexachloroethane 71-23-8, Propyl alcohol, properties 71-36-3, Butyl alcohol, properties 71-41-0, Pentyl alcohol, properties 71-43-2, Benzene, properties 74-82-8, Methane, properties 74-83-9, Bromomethane, properties 74-84-0, Ethane, properties 74-85-1, Ethylene, properties 74-86-2, Ethyne, properties 74-87-3, Chloromethane, properties 74-88-4, Iodomethane, properties 74-89-5, Methylamine, properties 74-93-1, Methanethiol, properties 74-96-4 74-98-6, Propane, properties 74-99-7, 1-Propyne 75-00-3, Chloroethane 75-01-4, properties 75-02-5, Fluoroethene 75-03-6, Iodoethane 75-04-7, Methylamine, properties 75-05-8, Acetonitrile, properties 75-07-0, Acetaldehyde, properties 75-09-2, properties 75-10-5, Difluoromethane 75-11-6, Diiodomethane 75-15-0, Carbon disulfide, properties 75-18-3, Methyl sulfide 75-19-4, Cyclopropane 75-21-8, Ethylene oxide, properties 75-26-3, 2-Bromopropane 75-28-5 75-29-6, 2-Chloropropane 75-30-9, 2-Iodopropane 75-33-2, 2-Propanethiol 75-34-3 75-35-4, 1,1-Dichloroethene, properties 75-36-5, Acetyl chloride 75-37-6, 1,1-Difluoroethane 75-38-7 75-43-4, Dichlorodifluoromethane 75-45-6, Chlorodifluoromethane 75-46-7, Trifluoromethane 75-47-8, Triiodomethane 75-50-3, Trimethylamine, properties 75-52-5, Nitromethane, properties 75-56-9, Propylene oxide, properties 75-64-9, tert-Butylamine, properties 75-65-0, properties 75-66-1, 2-Methyl-2-propanethiol 75-69-4, Trichlorofluoromethane 75-71-8, Dichlorodifluoromethane 75-72-9, Chlorotrifluoromethane 75-73-0, Carbon tetrafluoride 75-83-2, 2,2-Dimethylbutane 75-85-4, tert-Pentyl alcohol 76-01-7 76-13-1, 1,1,2-Trichlorotrifluoroethane 76-14-2 76-15-3, Chloropentafluoroethane 76-16-4, Hexafluoroethane 78-75-1, 1,2-Dibromopropane 78-76-2, 2-Bromobutane 78-79-5, 2-Methyl-1,3-butadiene, properties 78-82-0, Isobutyronitrile 78-86-4, 2-Chlorobutane 78-87-5, 1,2-Dichloropropane 78-92-2, sec-Butyl alcohol 78-93-3, 2-Butanone, properties 79-00-5, 1,1,2-Trichloroethane 79-01-6, Trichloroethene, properties 79-10-7, Acrylic acid, properties 79-24-3, Nitroethane 79-29-8, 2,3-Dimethylbutane 79-34-5, 1,1,2,2-Tetrachloroethane 79-46-9, 2-Nitropropane 86-89-5, 1-Pentyl-naphthalene 87-85-4, Hexamethylbenzene 90-12-0, 1-Methylnaphthalene 91-20-3, Naphthalene, properties 91-57-6, 2-Methylnaphthalene 92-52-4, Biphenyl, properties 93-22-1, 2-Pentyl-naphthalene 95-47-6, o-Xylene, properties 95-48-7, o-Cresol, properties 95-50-1, o-Dichlorobenzene 95-63-6, 1,2,4-Trimethylbenzene 95-93-2, 1,2,4,5-Tetramethylbenzene 96-14-0, 3-Methylpentane 96-18-4, 1,2,3-Trichloropropane 96-37-7, Methylcyclopentane 98-08-8 98-82-8, Cumene 98-83-9, properties 100-41-4, Ethylbenzene, properties 100-42-5, Styrene, properties 100-47-0, Benzonitrile, properties

100-80-1, m-Methylstyrene 102-25-0, 1,3,5-Triethylbenzene 103-65-1, Propylbenzene 104-51-8, Butylbenzene 104-72-3, 1-Phenyldecane 105-05-5, p-Diethylbenzene 106-42-3, p-Xylene, properties 106-44-5, properties 106-46-7, p-Dichlorobenzene 106-93-4, 1,2-Dibromoethane 106-94-5, 1-Bromopropane 106-95-6, 3-Bromo-1-propene, properties 106-97-8, Butane, properties 106-98-9, 1-Butene, properties 106-99-0, 1,3-Butadiene, properties 107-00-6, 1-Butyne 107-03-9, 1-Propanethiol 107-05-1, 3-Chloro-1-propene 107-06-2, 1,2-Dichloroethane, properties 107-08-4, 1-Iodopropane 107-10-8, Propylamine, properties 107-12-0, Propionitrile 107-13-1, 2-Propenenitrile, properties 107-18-6, Allyl alcohol, properties 107-21-1, Ethylene glycol, properties 107-31-3, Methyl formate 107-83-5, 2-Methylpentane 107-84-6, 1-Chloro-3-methylbutane 107-87-9, 2-Pentanone 108-03-2, 1-Nitropropane 108-08-7, 2,4-Dimethylpentane 108-20-3, Isopropyl ether 108-24-7, Acetic anhydride 108-38-3, m-Xylene, properties 108-39-4, properties 108-67-8, properties 108-86-1, Bromobenzene, properties 108-87-2, Methylcyclohexane 108-88-3, Toluene, properties 108-90-7, Chlorobenzene, properties 108-93-0, Cyclohexanol, properties 108-94-1, Cyclohexanone, properties 108-95-2, Phenol, properties 108-98-5, Benzenethiol, properties 108-99-6, 3-Picoline 109-06-8, 2-Picoline 109-65-9, 1-Bromobutane 109-66-0, Pentane, properties 109-67-1, 1-Pentene 109-69-3, 1-Chlorobutane 109-73-9, 1-Butanamine, properties 109-74-0, Butyronitrile 109-79-5, 1-Butanethiol 109-89-7, Diethylamine, properties 110-00-9, Furan 110-01-0, Thiacyclopentane 110-02-1, Thiophene 110-53-2, 1-Bromopentane 110-54-3, Hexane, properties 110-62-3, Valeraldehyde 110-66-7, 1-Pentanethiol 110-81-6, Ethyl disulfide 110-82-7, Cyclohexane, properties 110-83-8, Cyclohexene, properties 110-86-1, Pyridine, properties 111-27-3, Hexyl alcohol, properties 111-31-9, 1-Hexanethiol 111-43-3, Propyl ether 111-47-7, Propyl sulfide 111-65-9, Octane, properties 111-66-0, 1-Octene 111-70-6, Heptyl alcohol 111-71-7, Heptanal 111-84-2, Nonane 111-87-5, Octyl alcohol, properties 111-88-6, 1-Octanethiol 112-30-1, Decyl alcohol 112-31-2, Decanal 112-40-3, Dodecane 112-41-4, 1-Dodecene 112-42-5, Undecyl alcohol 112-51-6 112-53-8, Dodecyl alcohol 112-55-0, 1-Dodecanethiol 112-70-9, 1-Tridecanol 112-72-1, 1-Tetradecanol 112-88-9, 1-Octadecene 112-92-5, 1-Octadecanol 112-95-8, Eicosane 115-07-1, Propene, properties 115-10-6, Methyl ether 115-11-7, 2-Methylpropene, properties 115-25-3, Octafluorocyclobutane 116-14-3, Tetrafluoroethene, properties 118-74-1, Hexachlorobenzene 121-44-8, Triethylamine, properties 123-01-3, 1-Phenyldecane 123-02-4, 1-Phenyltridecane 123-38-6, Propionaldehyde, properties 123-72-8, Butyraldehyde 123-75-1, Pyrralidine, properties 123-91-1, p-Dioxane, properties 124-11-8, 1-Nonene 124-13-0, Octanal 124-18-5, Decane 124-19-6, Nonanal 124-38-9, Carbon dioxide, properties 124-40-3, properties 127-18-4, Tetrachloroethene, properties 135-01-3, o-Diethylbenzene 141-78-6, Ethyl acetate, properties 141-93-5, m-Diethylbenzene 142-28-9, 1,3-Dichloropropane 142-29-0, Cyclopentene 142-82-5, Heptane, properties 142-96-1, Butyl ether 143-08-8, Nonyl alcohol 143-10-2, 1-Decanethiol 151-56-4, Ethylenimine, properties 156-59-2, cis-1,2-Dichloroethene 156-60-5, trans-1,2-Dichloroethene 157-40-4, Spiropentane 275-51-4, Azulene 287-23-0, Cyclobutane 287-27-4, Thiacyclobutane 287-92-3, Cyclopentane 291-64-5, Cycloheptane 292-64-8, Cyclooctane  
 RL: PRP (Properties)  
 (heat capacity of, equation for calcn. of)  
 352-32-9, p-Fluorotoluene 352-93-2, Ethylsulfide 353-36-6, Fluoroethane 359-11-5, Trifluoroethene 367-11-3, o-Difluorobenzene 372-18-9, m-Difluorobenzene 392-56-3, Hexafluorobenzene 420-12-2, Thiacyclopentane 420-26-8, 2-Fluoropropane 420-46-2 460-12-8, 1,3-Butadiene 460-13-9, 1-Fluoropropane 460-19-5, Cyanogen 462-06-6, Fluorobenzene 463-49-0, 1,2-Propadiene 463-51-4, Ketene 463-58-1,

Carbonyl sulfide 463-82-1, 2,2-Dimethylpropane 464-06-2,  
 2,2,3-Trimethylbutane 488-23-3, 1,2,3,4-Tetramethylbenzene 493-01-6  
 493-02-7 503-17-3, 2-Butyne 507-09-5, Thioacetic acid, properties  
 507-19-7, 2-Bromo-2-methylpropane 507-20-0, 2-Chloro-2-methylpropane  
 513-35-9, 2-Methyl-2-butene 513-36-0, 1-Chloro-2-methylpropane  
 513-44-0, 2-Methyl-1-propanethiol 513-53-1, 2-Butanethiol 526-73-8,  
 1,2,3-Trimethylbenzene 527-53-7, 1,2,3,5-Tetramethylbenzene 533-98-2,  
 1,2-Dibromobutane 536-74-3, Ethynylbenzene 538-68-1, Pentylbenzene  
 540-36-3, p-Difluorobenzene 540-54-5, 1-Chloropropane 540-67-0,  
 Ethylmethyl ether 540-84-1, 2,2,4-Trimethylpentane 541-73-1,  
 m-Dichlorobenzene 543-59-9, 1-Chloropentane 544-25-2,  
 1,3,5-Cycloheptatriene 544-40-1, Butyl sulfide 544-76-3, Hexadecane  
 554-14-3, 2-Methylthiophene 556-56-9, 3-Iodo-1-propene 557-17-5,  
 Methyl propyl ether 558-17-8, 2-Iodo-2-methylpropane 558-37-2,  
 3,3-Dimethyl-1-butene 560-21-4, 2,3,3-Trimethylpentane 562-49-2,  
 3,3-Dimethylpentane 563-16-6, 3,3-Dimethylhexane 563-45-1,  
 3-Methyl-1-butene 563-46-2, 2-Methyl-1-butene 563-78-0,  
 2,3-Dimethyl-1-butene 563-79-1, 2,3-Dimethyl-2-butene 564-02-3,  
 2,2,3-Trimethylpentane 565-59-3, 2,3-Dimethylpentane 565-75-3,  
 2,3,4-Trimethylpentane 571-58-4, 1,4-Dimethylnaphthalene 571-61-9,  
 1,5-Dimethylnaphthalene 573-98-8, 1,2-Dimethylnaphthalene 575-37-1,  
 1,7-Dimethylnaphthalene 575-41-7, 1,3-Dimethylnaphthalene 575-43-9,  
 1,6-Dimethylnaphthalene 581-40-8, 2,3-Dimethylnaphthalene 581-42-0,  
 2,6-Dimethylnaphthalene 582-16-1, 2,7-Dimethylnaphthalene 583-48-2,  
 3,4-Dimethylhexane 584-94-1, 2,3-Dimethylhexane 589-34-4,  
 3-Methylhexane 589-43-5, 2,4-Dimethylhexane 589-53-7, 4-Methylheptane  
 589-81-1, 3-Methylheptane 590-18-1 590-19-2, 1,2-Butadiene 590-35-2,  
 2,2-Dimethylpentane 590-66-9, 1,1-Dimethylcyclohexane 590-73-8,  
 2,2-Dimethylhexane 591-50-4, Iodobenzene 591-76-4, 2-Methylhexane  
 591-93-5, 1,4-Pentadiene 591-95-7, 1,2-Pentadiene 591-96-8,  
 2,3-Pentadiene 592-13-2, 2,5-Dimethylhexane 592-27-8, 2-Methylheptane  
 592-41-6, 1-Hexene, properties 592-76-7, 1-Heptene 593-45-3,  
 Octadecane 593-53-3, Fluoromethane 593-60-2, Bromoethylene 593-70-4  
 594-20-7, 2,2-Dichloropropane 594-36-5, 2-Chloro-2-methylbutane  
 594-51-4, 2,3-Dibromo-2-methylbutane 594-82-1, 2,2,3,3-Tetramethylbutane  
 598-23-2, 3-Methyl-1-butyne 598-25-4, 3-Methyl-1,2-butadiene 598-29-8,  
 1,2-Diiodopropane 598-53-8, Methyl isopropyl ether 598-58-3, Methyl  
 nitrate 600-24-8, 2-Nitrobutane 604-88-6, Hexaethylbenzene 605-01-6,  
 Pentaethylbenzene 609-26-7, 3-Ethyl-2-methylpentane 611-14-3,  
 o-Ethyltoluene 611-15-4, o-Methylstyrene 616-12-6 616-44-4,  
 3-Methylthiophene 617-78-7, 3-Ethylpentane 619-99-8, 3-Ethylhexane  
 620-14-4, m-Ethyltoluene 622-96-8, p-Ethyltoluene 622-97-9,  
 p-Methylstyrene 624-29-3 624-64-6 624-73-7, 1,2-Diiodoethane  
 624-89-5, Ethylmethyl sulfide 624-91-9, Methyl nitrite 624-92-0,  
 Methyl disulfide 625-27-4, 2-Methyl-2-pentene 625-58-1, Ethyl nitrate  
 625-80-9, Isopropyl sulfide 627-05-4, 1-Nitrobutane 627-13-4, Propyl  
 nitrate 627-19-0, 1-Pentyne 627-20-3 627-21-4, 2-Pentyne 628-29-5,  
 Butylmethyl sulfide 628-71-7, 1-Heptyne 629-05-0, 1-Octyne 629-19-6,  
 Propyl disulfide 629-20-9, 1,3,5,7-Cyclooctatetraene 629-45-8, Butyl  
 disulfide 629-50-5, Tridecane 629-59-4, Tetradecane 629-62-9,  
 Pentadecane 629-65-2, Heptyl sulfide 629-73-2, 1-Hexadecene  
 629-74-3, 1-Hexadecyne 629-76-5, 1-Pentadecanol 629-78-7, Heptadecane  
 629-89-0, 1-Octadecyne 629-92-5, Nonadecane 629-96-9, 1-Eicosanol  
 630-08-0, Carbon monoxide, properties 635-81-4,  
 1,2,4,5-Tetraethylbenzene 638-04-0 638-46-0, Butylethyl sulfide  
 642-32-0, 1,2,3,4-Tetraethylbenzene 646-04-8 674-76-0 689-97-4,  
 1-Buten-3-yne 691-37-2, 4-Methyl-1-pentene 691-38-3 693-02-7,  
 1-Hexene 693-83-4, Decyl sulfide 693-89-0, 1-Methylcyclopentene  
 700-12-9 760-20-3, 3-Methyl-1-pentene 760-21-4, 2-Ethyl-1-butene  
 763-29-1, 2-Methyl-1-pentene 764-93-2, 1-Decyne 765-03-7, 1-Dodecyne  
 765-10-6, 1-Tetradecyne 765-13-9, 1-Pentadecyne 765-27-5, 1-Eicosyne  
 766-90-5 821-95-4, 1-Undecene 822-27-5 822-35-5, Cyclobutene

822-50-4 871-83-0, 2-Methylnonane 872-05-9, 1-Decene 872-10-6,  
 Pentyll sulfide 873-66-5 877-44-1, 1,2,4-Triethylbenzene 921-47-1,  
 2,3,4-Trimethylhexane 922-28-1, 3,4-Dimethylheptane 922-62-3  
 926-82-9, 3,5-Dimethylheptane 929-98-6, Nonyll sulfide 939-27-5,  
 2-Ethyl-naphthalene 1067-08-9, 3-Ethyl-3-methylpentane 1067-20-5,  
 3,3-Diethylpentane 1068-19-5, 4,4-Dimethylheptane 1068-87-7,  
 3-Ethyl-2,4-dimethylpentane 1069-53-0, 2,3,5-Trimethylhexane  
 1070-87-7, 2,2,4,4-Tetramethylpentane 1071-26-7, 2,2-Dimethylheptane  
 1071-81-4, 2,2,5,5-Tetramethylhexane 1072-05-5, 2,6-Dimethylheptane  
 1072-16-8, 2,7-Dimethyloctane 1077-16-3, Hexylbenzene 1078-71-3,  
 1-Phenylheptane 1081-77-2, 1-Phenyl-nonane 1120-21-4, Undecane  
 1120-36-1, 1-Tetradecene 1120-62-3, 3-Methylcyclopentene 1127-76-0,  
 1-Ethyl-naphthalene 1134-62-9, 2-Butyl-naphthalene 1186-53-4,  
 2,2,3,4-Tetramethylpentane 1189-99-7, 2,5,5-Trimethylheptane  
 1190-83-6, 2,2,6-Trimethylheptane 1192-18-3 1454-84-8, 1-Nonadecanol  
 1454-85-9, 1-Heptadecanol 1455-21-6, 1-Nonanethiol 1459-09-2,  
 1-Phenylhexadecane 1459-10-5 1551-21-9, Isopropyl methyl sulfide  
 1574-41-0 1613-46-3, Butylpropyl sulfide 1613-51-0, Thiacyclohexane  
 1630-77-9, cis-1,2-Difluoroethene 1630-78-0, trans-1,2-Difluoroethene  
 1634-04-4, Methyl tert-butyl ether 1634-09-9, 1-Butyl-naphthalene  
 1638-26-2, 1,1-Dimethylcyclopentane 1639-09-4, 1-Heptanethiol  
 1640-89-7, Ethylcyclopentane 1678-91-7, Ethylcyclohexane 1678-92-8,  
 Propylcyclohexane 1678-93-9, Butylcyclohexane 1679-07-8,  
 Cyclopentanethiol 1679-09-0, 2-Methyl-2-butanethiol 1712-64-7,  
 Isopropyl nitrate 1741-83-9, Methylpentyl sulfide 1759-58-6  
 1759-81-5, 4-Methylcyclopentene 1795-15-9, 1-Cyclohexyloctane  
 1795-16-0 1795-17-1, 1-Cyclohexyldodecane 1795-18-2,  
 1-Cyclohexyltetradecane 1795-20-6 1795-21-7 1795-22-8 1795-26-2  
 1795-27-3

RL: PRP (Properties)

(heat capacity of, equation for calcn. of)

IT 2004-70-8 2027-19-2, 2-Propylnaphthalene 2040-95-1, Butylcyclopentane  
 2040-96-2, Propylcyclopentane 2051-30-1, 2,6-Dimethyloctane 2079-95-0,  
 1-Tetradecanethiol 2131-18-2 2189-60-8, 1-Phenyl-octane 2207-01-4  
 2207-03-6 2207-04-7 2213-23-2, 2,4-Dimethylheptane 2216-30-0,  
 2,5-Dimethylheptane 2216-32-2, 4-Ethylheptane 2216-33-3,  
 3-Methyloctane 2216-34-4, 4-Methyloctane 2243-98-3, 1-Undecyne  
 2437-56-1, 1-Tridecene 2532-58-3 2613-61-8, 2,4,6-Trimethylhexane  
 2690-08-6 2765-18-6, 1-Propylnaphthalene 2851-83-4 2882-98-6,  
 1-Cyclopentyl-nonane 2883-02-5 2885-00-9, 1-Octadecanethiol  
 2917-26-2, 1-Hexadecanethiol 3074-71-3, 2,3-Dimethylheptane  
 3074-75-7, 4-Ethyl-2-methylhexane 3074-76-8, 3-Ethyl-3-methylhexane  
 3074-77-9, 3-Ethyl-4-methylhexane 3129-90-6, Isothiocyanic acid  
 3178-29-8, 4-Propylheptane 3221-61-2, 2-Methyloctane 3452-07-1,  
 1-Eicosene 3452-09-3, 1-Nonyne 3522-94-9, 2,2,5-Trimethylhexane  
 3698-89-3 3698-93-9 3698-94-0, Ethyloctyl sulfide 3698-95-1,  
 Methyloctyl sulfide 3741-00-2 3877-15-4, Methyl propyl sulfide  
 4032-86-4, 3,3-Dimethylheptane 4032-92-2, 2,4,4-Trimethylheptane  
 4032-93-3, 2,3,6-Trimethylheptane 4032-94-4, 2,4-Dimethyloctane  
 4050-45-7 4110-44-5, 3,3-Dimethyloctane 4110-50-3, Ethylpropyl sulfide  
 4292-75-5 4292-92-6, Pentyllcyclohexane 4457-00-5 4485-77-2  
 4669-01-6 4753-80-4, Thiacycloheptane 5171-84-6,  
 3,3,4,4-Tetramethylhexane 5332-52-5, 1-Undecanethiol 5408-86-6,  
 2,3-Dibromobutane 5617-41-4 5617-42-5 5634-30-0 5881-17-4,  
 3-Ethyl-octane 5911-04-6, 3-Methylnonane 6006-33-3 6006-34-4  
 6006-95-7 6163-66-2, tert-Butyl ether 6294-31-1, Hexyl sulfide  
 6742-54-7, 1-Phenylundecane 6765-39-5, 1-Heptadecene 6785-23-5  
 6812-38-0 6812-39-1 6863-58-7, sec-Butyl ether 6876-18-2 6876-23-9  
 7146-60-3, 2,3-Dimethyloctane 7154-79-2 7154-80-5 7220-26-0,  
 3-Ethyl-2,4-dimethylhexane 7289-44-3 7289-45-4, Methyltetradecyl  
 sulfide 7309-44-6, Ethylhexyl sulfide 7372-86-3,  
 2-Ethyl-6-methylnaphthalene 7642-09-3 7688-21-3 10496-15-8

10496-16-9 10496-18-1 13269-52-8 13360-61-7, 1-Pentadecene  
 13373-97-2, 1-Eicosanethiol 13475-78-0, 5-Ethyl-2-methylheptane  
 13475-79-1 13475-81-5, 2,2,3,3-Tetramethylhexane 13952-84-6,  
 sec-Butylamine 14676-29-0, 3-Ethyl-2-methylheptane 14720-74-2,  
 2,2,4-Trimethylheptane 15869-80-4, 3-Ethylheptane 15869-85-9,  
 5-Methylnonane 15869-86-0, 4-Ethyldecane 15869-87-1,  
 2,2-Dimethyloctane 15869-89-3, 2,5-Dimethyloctane 15869-92-8,  
 3,4-Dimethyloctane 15869-93-9, 3,5-Dimethyloctane 15869-94-0,  
 3,6-Dimethyloctane 15869-95-1, 4,4-Dimethyloctane 15869-96-2,  
 4,5-Dimethyloctane 16747-25-4, 2,2,3-Trimethylhexane 16747-26-5,  
 2,2,4-Trimethylhexane 16747-28-7, 2,3,3-Trimethylhexane 16747-30-1,  
 2,4,4-Trimethylhexane 16747-31-2, 3,3,4-Trimethylhexane 16747-32-3,  
 3-Ethyl-2,2-dimethylpentane 16747-33-4, 3-Ethyl-2,3-dimethylpentane  
 16747-38-9, 2,3,3,4-Tetramethylpentane 16747-42-5,  
 2,2,4,5-Tetramethylhexane 16747-44-7, 2,2,3,3,4-Pentamethylpentane  
 16747-45-8, 2,2,3,4,4-Pentamethylpentane 16789-46-1,  
 3-Ethyl-2-methylhexane 16900-07-5, Butyloctyl sulfide 16900-08-6,  
 Butyldodecyl sulfide 16967-04-7, Butylhexyl sulfide 17059-55-1  
 17301-94-9, 4-Methylnonane 17302-01-1, 3-Ethyl-3-methylheptane  
 17302-02-2 17302-04-4 17348-59-3, Isopropyl tert-butyl ether  
 18435-45-5, 1-Nonadecene 18437-89-3 19313-57-6 19313-61-2,  
 Decylthiol sulfide 19398-77-7, 3,4-Diethylhexane 19484-26-5,  
 1-Tridecanethiol 20278-84-6, 2,4,5-Trimethylheptane 20278-85-7,  
 2,3,5-Trimethylheptane 20278-87-9, 3,3,4-Trimethylheptane 20278-88-0,  
 3,4,4-Trimethylheptane 20291-60-5, Hexylmethyl sulfide 20291-61-6,  
 Heptylmethyl sulfide 20291-91-2 20291-95-6, 2,2,5-Trimethylheptane  
 22438-39-7, Decylmethyl sulfide 24768-42-1, Butylpentyl sulfide  
 24768-43-2 24768-44-3, Ethylheptyl sulfide 24768-46-5, Heptylpropyl  
 sulfide 25276-70-4, 1-Pentadecanethiol 26158-99-6, Ethylpentyl sulfide  
 26186-00-5, 1-Heptadecyne 26186-01-6, 1-Nonadecyne 26186-02-7,  
 1-Tridecyne 27563-68-4, Hexadecylmethyl sulfide 31032-94-7  
 36553-82-4, 1-Hexadecanol 38842-05-6, 1,2,3,5-Tetraethylbenzene  
 40289-98-3 40813-84-1 41947-84-6 42205-08-3 42841-80-5,  
 Pentylpropyl sulfide 51750-65-3, 2,2,4,4-Tetramethylhexane 52896-87-4,  
 4-Isopropylheptane 52896-88-5 52896-89-6 52896-90-9 52896-91-0,  
 3-Ethyl-4-methylheptane 52896-92-1, 2,2,3-Trimethylheptane 52896-93-2,  
 2,3,3-Trimethylheptane 52896-95-4 52896-99-8 52897-00-4 52897-01-5  
 52897-03-7 52897-04-8 52897-05-9 52897-06-0 52897-08-2,  
 2,2,3,4-Tetramethylhexane 52897-09-3, 2,2,3,5-Tetramethylhexane  
 52897-10-6, 2,3,3,4-Tetramethylhexane 52897-11-7,  
 2,3,3,5-Tetramethylhexane 52897-12-8, 2,3,4,4-Tetramethylhexane  
 52897-15-1, 2,3,4,5-Tetramethylhexane 52897-16-2 52897-17-3,  
 3-Ethyl-2,2,3-trimethylpentane 52897-18-4 52897-19-5,  
 3-Ethyl-2,3,4-trimethylpentane 53161-72-1 53193-22-9,  
 1-Heptadecanethiol 53193-23-0, 1-Nonadecanethiol 54105-66-7  
 59973-07-8, Methylnonyl sulfide 59973-08-9 62103-66-6 62155-09-3  
 62155-10-6, Methylpentadecyl sulfide 62155-11-7 62155-12-8  
 64199-20-6 66271-54-3 66271-55-4 66271-81-6 66271-82-7  
 66271-83-8 66292-31-7, Ethylhexadecyl sulfide 66292-32-8 66292-33-9  
 66359-40-8 66359-41-9 66359-42-0 66455-35-4 66577-30-8  
 66577-31-9 66577-32-0 66577-61-5 66577-62-6 66826-84-4

RL: PRP (Properties)

(heat capacity of, equation for calcn. of)

SO U.S., 15 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 IC C07F; A01N  
 INCL 260948000  
 CC 23-8 (Aliphatic Compounds)  
 Section cross-reference(s): 5

FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3927148	A	19751216	US 1973-377874	19730709
PRAI	US 1969-821117	A1	19690501		
	US 1971-173267	A3	19710819		

CLASS

	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
	US 3927148	IC	C07F; A01N
		INCL	260948000
		IPCI	C07F0009-165 [ICM]; C07F0009-00 [ICM,C*]; A01N0009-36 [ICS]
		IPCR	A01N0057-00 [I,C*]; A01N0057-12 [I,A]; C07F0009-00 [I,C*]; C07F0009-165 [I,A]
		NCL	558/183.000; 558/184.000; 558/187.000; 987/209.000
		ECLA	A01N0057/12; C07F009/165A1+M
AB	Five (RO)2P(S)S(CH2)nCH(SR1)R2 (R = Et, hexadecyl; n = 0, 1, 3; R1 = Et, 4-chlorophenyl, octyl; R2 = Me, H) were O-dealkylated and S-alkylated with R3Br (R3 = Pr, Et, dodecyl) to give the resp. RO(R3S)P(O)S(CH2)nCH(SR1)R2 (I). The addition reaction of 13 RO(R1S)P(O)S(CH2)nCH:CHR2 (R = Et, Me, Pr; R1 = Pr, CH2CHMe2, Bu, CHMe2; n = 0, 1; R2 = Me, Et, CMe3) with R3SH (R3 = Me, Et, CHMe2, Pr, hexyl) gave the resp. RO(R1S)P(O)S(CH2)nCH2CH(SR3)R2 (II). The I and II demonstrated pesticidal activity.		
ST	alkylthioalkyl dialkyl dithiophosphate pesticide; alkenyl dithiophosphate addn alkanethiol		
IT	Pesticides		
	(O,S-dialkyl S-alkylthioalkyl dithiophosphates)		
IT	Dealkylation		
	(O-, of O,O-dialkyl S-alkylthioalkyl dithiophosphates, S-alkylation of products from)		
IT	Alkylation		
	(S-, of O-alkyl-S-(alkylthioalkyl)dithiophosphoric acids with alkyl bromides)		
IT	786-19-6	22911-14-4	57342-34-4
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(O-Dealkylation and S-alkylation of)		
IT	298-02-2	17346-57-5	57342-43-5
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(O-dealkylation and S-alkylation of)		
IT	74-96-4	106-94-5	143-15-7
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(S-alkylation of O-alkyl-S-(alkylthioalkyl)dithiophosphoric acids with)		
IT	111-85-3	4860-03-1	
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(S-alkylation of O-alkyl-S-alkenyl dithiophosphoric acid derivative with)		
IT	2917-26-2	27941-98-6	
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(addition reaction of, with O,S-dialkyl S-alkenyl dithiophosphate derivative)		
IT	74-93-1	75-08-1	75-33-2 107-03-9 111-31-9
	RL: RCT (Reactant); RACT (Reactant or reagent)		
	(addition reaction of, with O,S-dialkyl S-alkenyl dithiophosphates)		
IT	27564-69-8	27564-71-2	27564-72-3 27564-73-4 27564-77-8



57342-37-7 57342-38-8 57342-39-9 57342-40-2  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (addition reaction of, with alkanethiols)

IT 57342-36-6P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation and S-alkylation of, with dodecyl bromide)

IT 57342-45-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation and S-alkylation of, with hexadecyl chloride)

IT 57342-47-9P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation and S-alkylation of, with octyl chloride)

IT 57342-42-4P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation and addition reaction of, with hexadecanethiol)

IT 57342-41-3P  
 RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT  
 (Reactant or reagent)  
 (preparation and addition reaction of, with trichlorobenzenethiol)

IT 32039-91-1P 32064-96-3P 32064-97-4P 32064-98-5P 32064-99-6P  
 32065-00-2P 32065-01-3P 32065-02-4P 32065-03-5P 32065-04-6P  
 32065-05-7P 32065-06-8P 32065-07-9P 32065-08-0P 32065-10-4P  
 57341-50-1P 57342-31-1P 57342-32-2P 57342-33-3P 58588-84-4P  
 RL: BAC (Biological activity or effector, except adverse); BSU (Biological  
 study, unclassified); SPN (Synthetic preparation); BIOL (Biological  
 study); PREP (Preparation)  
 (preparation and pesticidal activity of)

L23 ANSWER 9 OF 10 CAPLUS COPYRIGHT 2009 ACS ON STN  
 AN 1975:592556 CAPLUS  
 DN 83:192556  
 OREF 83:30261a,30264a  
 ED Entered STN: 12 May 1984  
 TI Pesticidal O,S'-dialkyl S-alkylthioalkyl dithiophosphates  
 IN Oswald, Alexis A.; Valint, Paul L., Jr.  
 PA Exxon Research and Engineering Co., USA  
 SO U.S., 16 pp.  
 CODEN: USXXAM

DT Patent  
 LA English  
 IC C07F; A01N  
 INCL 260949000  
 CC 23-8 (Aliphatic Compounds)  
 Section cross-reference(s): 5  
 FAN.CNT 4

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3904710	A	19750909	US 1973-377872	19730709
PRAI	US 1969-821117	A1	19690501		
	US 1971-173267	A3	19710819		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 3904710	IC	C07F; A01N
	INCL	260949000
	IPCI	C07F0009-165 [ICM]; C07F0009-00 [ICM,C*]; A01N0009-36 [ICS]
	IPCR	A01N0057-00 [I,C*]; A01N0057-14 [I,A]; C07F0009-00

[I,C\*]; C07F0009-165 [I,A]  
NCL 558/187.000; 558/183.000; 558/184.000; 987/209.000  
ECLA A01N057/14; C07F009/165A1+M

AB Esters RSQSP(S) (OR1)2 (R = Et, octyl, 4-ClC6H4; Q = Cl-4 straight-chain or branched alkylene; R1 = Et, hexadecyl) were O-dealkylated with amine catalysts and the products were S-alkylated with R2Br to give five RSQSP(O) (OR1)SR2 (R2 = Et, Pr, dodecyl) which exhibited pesticidal, insecticidal, and miticidal activity. Twelve RCH(SR3)CH2SP(O) (OR1)SR2 (R = Cl-4 alkyl, R1 = Cl-8 alkyl, R2 = C3-16 alkyl, R3 = Cl-6 alkyl), which also demonstrated the above properties, were prepared from RCH:CHSP(O) (OR1)SR2 and R3SH.

ST alkyl dithiophosphate pesticide insecticide; miticide alkyl dithiophosphate; alkylthioalkyl dithiophosphate pesticide miticide; dealkylation catalytic trialkyl dithiophosphate; alkylation dialkyl dithiophosphate sulfur

IT Acaricides  
Insecticides  
Pesticides  
(O,S-dialkyl S-alkylthioalkyl dithiophosphates)

IT Dealkylation catalysts  
(O-, amines, for O,O-dialkyl S-alkylthioalkyl dithiophosphates)

IT Alkylation  
(S-, of O-alkyl S-alkylthioalkyl dithiophosphates with alkyl bromides)

IT Addition reaction  
(of O,S-dialkyl S-alkenyl dithiophosphates with alkanethiols)

IT 298-04-4 786-19-6 17346-57-5 22911-14-4 57342-34-4 57342-43-5  
57583-99-0  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(O-dealkylation of, catalysts for)

IT 111-85-3 4860-03-1  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(S-alkylation of O-alkyl S-alkenyl dithiophosphates with)

IT 74-96-4 106-94-5 143-15-7  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(S-alkylation of O-alkyl S-alkylthioalkyl dithiophosphates with)

IT 74-93-1 75-08-1 75-33-2 107-03-9 111-31-9 2917-26-2  
27941-98-6  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(addition reaction of, with O,S-dialkyl S-alkenyl dithiophosphates)

IT 27564-69-8 27564-71-2 27564-72-3 27564-73-4 27564-77-8  
57342-37-7 57342-38-8 57342-39-9 57342-40-2 57342-41-3  
57342-42-4  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(addition reaction of, with alkanethiols)

IT 75-50-3, uses and miscellaneous 280-57-9 7664-41-7, uses and miscellaneous  
RL: CAT (Catalyst use); USES (Uses)  
(catalyst, for O-dealkylation of O,O-dialkyl S-alkylthioalkyl dithiophosphates)

IT 57342-36-6P 57342-45-7P 57342-47-9P  
RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)  
(preparation and S-alkylation of)

IT 32039-91-1P 32064-96-3P 32064-97-4P 32064-99-6P 32065-00-2P  
32065-01-3P 32065-02-4P 32065-03-5P 32065-04-6P 32065-05-7P  
32065-06-8P 32065-07-9P 32065-08-0P 32065-09-1P 32065-10-4P  
57341-50-1P 57342-31-1P 57342-32-2P 57342-33-3P 57517-30-3P  
RL: BAC (Biological activity or effector, except adverse); BSU (Biological study, unclassified); SPN (Synthetic preparation); BIOL (Biological study); PREP (Preparation)  
(preparation and pesticidal activity of)

AN 1961:12985 CAPLUS

DN 55:12985

OREF 55:2478g-i,2479a-g

ED Entered STN: 22 Apr 2001

TI S-Alkylmercaptosuccinic acids as solid derivatives of olefins, alkyl bromides, and mercaptans

AU Hendrickson, Joe G.; Hatch, Lewis F.

CS Univ. of Texas, Austin

SO Journal of Organic Chemistry (1960), 25, 1747-52

CODEN: JOCEAH; ISSN: 0022-3263

DT Journal

LA Unavailable

CC 10B (Organic Chemistry: Aliphatic Compounds)

AB Solid S-alkylmercaptosuccinic acids were prepared from olefins, mercaptans, and alkyl bromides and their m.ps. and solubilities studied as a function of structure of the alkyl group. These properties varied with structure in a predictable manner. The acids were satisfactory solid derivs. for primary olefins and mercaptans and both primary and secondary alkyl bromides because of the ease with which the reaction could be effected, the good yields obtained, and the ease of purification. They had the added advantage of being acids; thus their neutralization equivs. could be obtained for confirmatory characterization. Mercaptosuccinic acid (I) (2 g.) and 3 ml. MeOH heated until the acid had completely dissolved, the solution cooled, 1 ml. olefin plus 0.10 g. Bz2O2 added, the tube stoppered, shaken 5 min., left at room temperature, the crystals washed with H2O, and treated with 25 ml. 6N HCl gave 1.3-1.9 g. products. The crystals were recovered by vacuum filtration, dried 12 hrs. at room temperature, 1 g. of the derivative dissolved in 10-15 ml. Et2O, then pentane added, the mixture filtered, the crystals discarded, pentane added to the filtrate, and the crystals separated. Di-Na maleate (20 ml., 1.0M), 2 ml. alc., 1 ml. mercaptan, and chips were refluxed 2-4 hrs., the mixture cooled, the lower layer separated, diluted with 10 ml. concentrated HCl, the mercaptan derivative precipitated, and purified in the same manner as the products from the I-olefin reaction. The yield usually was in the range 0.8-2.0 g. I (1.00 ml.), 2 ml. ProH, 1 ml. alkyl bromide, 25 ml. 1.33N KOH, and chips were refluxed 4-24 hrs., the aqueous layer extracted with pentane, 10 ml. concentrated HCl added to the aqueous layer, and the precipitated material recrystd. as usual. The S-alkylmercaptosuccinic acids

were titrated with 0.07N KOH to phenolphthalein end point in the presence of 5 ml. EtOH and 40 ml. H2O; the higher mol. weight derivs. were titrated in warm solution because of their limited solubility. The following results were thus

obtained (R of RSCH(CO2H)CH2CO2H, olefin, % yield of olefin, m.p., % yield of mercaptan, m.p., % yield of bromide and m.p. given): Pr, -, -, -, -, 78, 118.4-18.8°; 1-Bu, -, -, -, 43, 103.7-4.0°, -, 2-Bu, -, -, -, -, 60, 134.9-5.1°; iso-Bu, -, -, -, -, 41, 120.9-1.4°; tert-Bu, -, -, -, -, 1-pentyl, 1-pentene, 85, 107.3-7.6°, 100, 107.7-8.0°, 60, 107.0-7.6°; 2-pentyl, -, -, -, -, 50, 134.8-5.4°; 3-pentyl, -, -, -, -, 39, 153.8-4.1°; 2-methylbutyl, 2-methyl-1-butene, 85, 122.3-2.6°, -, -, -, isopentyl, -, -, -, -, 65, 115.6-16.0°; 1,2-dimethylpropyl, 2-methyl-2-butene, 75, 153.7-4.0°, -, -, -, 1-hexyl, 1-hexene, 100, 95.4-5.7°, 79, 96.0-6.2°, 91, 96.3-6.5°; 2-hexyl, -, -, -, -, 31, 123.9-5.0°; 3-hexyl, -, -, -, -, 24, 143.4-3.5°; 3-methylpentyl, -, -, -, -, 84, 111.9-12.3°; 4-methylpentyl, 4-methyl-1-pentene, 92, 102.6-2.9°, -, -, -, 1-isopropylpropyl, 2-methyl-2-pentene, -, -, 60, 152.1-2.6°, -, -, 2-ethylbutyl, -, -,

- , - , 75, 132.4-2.8°; 1-heptyl, 1-heptene, 88, 103.4-3.9°, 82, 105.8-6.2°, - , - ; 2-heptyl, - , - , - , 31, 128.0-9.1°; 3-heptyl, - , - , - , 21, 144.9-5.4°; 4,4-di-methylpentyl, 4,4-dimethyl-1-pentene, 90, 119.0-19.5°, - , - , - ; 1-methyl-2-ethylbutyl, 3-ethyl-2-pentene, 45, 148.9-9.9°, - , - , - ; 1-octyl, 1-octene, 96, 96.1-6.6°, - , - , - ; 2-octyl, - , - , - , 50, 128.0-9.0°; 3-octyl, 2-octene, 94, 142.9-3.5°, - , - , - ; 2-ethyl-hexyl, 2-ethyl-1-hexene, 81, 101.9-2.7°, - , - , 59, 103.7-4.2°; 2-cyclohexylethyl, - , - , - , - , 47, 126.3-6.8°; 1-nonyl, - , - , 85, 105.0-6.0°, 43, 105.0-5.5°; 3-phenylpropyl, - , - , 98, 114.9-15.7°, - , - ; 1-decyl, 1-decene, 82, 93.5-3.8°, - , - , - ; 1-undecyl, - , - , - , - , 37, 110.4-10.6°; 1-tetradecyl, 1-tetradecene, 76, 104.0-4.8°, - , - , - ; 1-hexadecyl, 1-hexadecene, 84, 105.0-5.8°, - , - , - ; 1-octadecyl, - , - , 100, 102-3°, - , - ; cyclopentyl, cyclopentene, 75, 142.8-3.1°, - , - , - ; cyclohexyl, cyclohexene, 83, 150.5-1.1°, - , - , 9, 149.0-9.9°; 2-methylcyclohexyl, 2-methylcyclohexene, 73, 187.0-7.3°, - , - , - ; 4-methylcyclohexyl, - , - , 6, 148.7-9.3°, - , - ; benzyl, - , - , 97, 188.4-8.9°, - , - ; p-chlorophenyl, - , - , - , - ; 3-thienyl, - , - , - , - , - ; 3-chloropropyl, allyl chloride, 35, 108.5-8.8°, - , - , - . The following solubilities of RSCH(CO<sub>2</sub>H)CH<sub>2</sub>CO<sub>2</sub>H in PhMe at 50.0° were obtained (R and g./100 g. PhMe given): 1-Pr, 0.30; 2-Bu, 0.46; iso-Bu, 0.87; 2-methylbutyl, 4.00; 2-methyl-2-butyl, 0.14; 2-ethylbutyl, 2.59; octadecyl, 3.70; cyclohexyl, 0.25; 2-cyclohexylethyl, 1.90; 3-chloropropyl, 0.67.

# IT Alkyl bromides

## Olefins

(identification of)

# IT Thiols

(separation and determination of)

# IT 110-83-8, Cyclohexene

(detection of)

# IT 78-76-2, Butane, 2-bromo- 78-77-3, Propane, 1-bromo-2-methyl-100-53-8, α-Toluenethiol 106-94-5, Propane, 1-bromo-107-05-1, Propene, 3-chloro- 107-81-3, Pentane, 2-bromo- 107-82-4, Butane, 1-bromo-3-methyl- 108-85-0, Cyclohexane, bromo- 109-67-1, 1-Pentene 109-79-5, 1-Butanethiol 110-53-2, Pentane, 1-bromo-110-66-7, 1-Pentanethiol 111-25-1, Hexane, 1-bromo- 111-31-9, 1-Hexanethiol 111-66-0, 1-Octene 111-67-1, 2-Octene 142-29-0, Cyclopentene 513-35-9, 2-Butene, 2-methyl- 557-35-7, Octane, 2-bromo-563-46-2, 1-Butene, 2-methyl- 591-49-1, Cyclohexene, 1-methyl-592-41-6, 1-Hexene 592-76-7, 1-Heptene 625-27-4, 2-Pentene, 2-methyl-629-73-2, 1-Hexadecene 691-37-2, 1-Pentene, 4-methyl- 693-58-3, Nonane, 1-bromo- 693-67-4, Undecane, 1-bromo- 762-62-9, 1-Pentene, 4,4-dimethyl- 816-79-5, 2-Pentene, 3-ethyl- 872-05-9, 1-Decene 1120-36-1, 1-Tetradecene 1455-21-6, 1-Nonanethiol 1632-16-2, 1-Hexene, 2-ethyl- 1639-09-4, 1-Heptanethiol 1647-26-3, Cyclohexane, (2-bromoethyl)- 1809-10-5, Pentane, 3-bromo- 1974-04-5, Heptane, 2-bromo- 1974-05-6, Heptane, 3-bromo- 2885-00-9, 1-Octadecanethiol 3377-86-4, Hexane, 2-bromo- 3377-87-5, Hexane, 3-bromo- 3814-34-4, Pentane, 3-(bromomethyl)- 18908-66-2, Heptane, 3-(bromomethyl)- 24734-68-7, 1-Propanethiol, 3-phenyl- 51116-73-5, Pentane, 1-bromo-3-methyl- 60260-87-9, Cyclohexanethiol, 4-methyl- (identification of)

# IT 5413-66-1P, Succinic acid, (pentylthio)- 6188-77-8P, Succinic acid, (octylthio)- 22119-10-4P, Succinic acid, (benzylthio)- 26819-75-0P, Succinic acid, (isobutylthio)- 26819-76-1P, Succinic acid, (isopentylthio)- 45015-91-6P, Succinic acid, (propylthio)- 45084-17-1P, Succinic acid, (butylthio)- 60713-01-1P, Succinic acid, (tetradecylthio)- 60713-02-2P, Succinic acid, (hexadecylthio)-

60745-27-9P, Succinic acid, (decylthio)- 65594-35-6P, Succinic acid, (hexylthio)- 85927-34-0P, Succinic acid, (octadecylthio)- 98431-24-4P, Succinic acid, (3-chloropropylthio)- 99174-55-7P, Succinic acid, (1-ethyl-2-methylpropylthio)- 99183-70-7P, Succinic acid, (1,2-dimethylpropylthio)- 99183-71-8P, Succinic acid, (1-ethylpropylthio)- 99974-58-0P, Succinic acid, (cyclohexylthio)- 100048-63-3P, Succinic acid, (4,4-dimethylpentylthio)- 100048-64-4P, Succinic acid, (2-ethyl-1-methylbutylthio)- 100048-65-5P, Succinic acid, (1-ethylpentylthio)- 100048-66-6P, Succinic acid, (heptylthio)- 100048-67-7P, Succinic acid, (1-methylhexylthio)- 100145-30-0P, Succinic acid, (cyclopentylthio)- 100250-93-9P, Succinic acid, (1-methylheptylthio)- 100315-91-1P, Succinic acid, (2-cyclohexylethylthio)- 100538-68-9P, Succinic acid, (nonylthio)- 100613-26-1P, Succinic acid, (3-phenylpropylthio)- 103204-54-2P, Succinic acid, [2-ethylbutylthio]- 103204-55-3P, Succinic acid, [3-methylpentylthio]- 103205-84-1P, Succinic acid, [1-ethylbutylthio]- 103205-85-2P, Succinic acid, [1-methylpentylthio]- 103260-48-6P, Succinic acid, [2-methylbutylthio]- 103263-72-5P, Succinic acid, [1-methylbutylthio]- 104177-65-3P, Succinic acid, [4-methylcyclohexylthio]- 104178-83-8P, Succinic acid, [2-methylcyclohexylthio]- 105906-88-5P, Succinic acid, [2-ethylhexylthio]- 105910-67-6P, Succinic acid, [1-ethylhexylthio]- 114098-60-1P, Succinic acid, (isohexylthio)- 120089-21-6P, Succinic acid, (sec-butylthio)- 131731-38-9P, Succinic acid, undecylthio-  
 RL: PREP (Preparation)  
 (preparation of)  
 IT 70-49-5, Succinic acid, mercapto-  
 (S-alkyl derivs.)

=> s (106-94-5 or 2885-00-9 or 2917-26-2 or 22811-02-5 or 10220-46-9) and (silver or ag)

REGISTRY INITIATED

Substance data SEARCH and crossover from CAS REGISTRY in progress...  
 Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L25 50 L24

REGISTRY INITIATED

Substance data SEARCH and crossover from CAS REGISTRY in progress...  
 Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L27 6 L26

REGISTRY INITIATED

Substance data SEARCH and crossover from CAS REGISTRY in progress...  
 Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L29 1621 L28

REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L31 2011 L30

REGISTRY INITIATED  
Substance data SEARCH and crossover from CAS REGISTRY in progress...  
Use DISPLAY HITSTR (or FHITSTR) to directly view retrieved structures.

L33 4963 L32

379472 SILVER  
342330 AG  
L34 510 ( L33 OR L31 OR L29 OR L27 OR L25 ) AND (SILVER OR AG)

=> s polish##### or tarnish##### or detarnish#####  
117992 POLISH#####  
3049 TARNISH#####  
9 DETARNISH#####  
L35 120792 POLISH##### OR TARNISH##### OR DETARNISH#####

=> l34 and l35  
L34 IS NOT A RECOGNIZED COMMAND  
The previous command name entered was not recognized by the system.  
For a list of commands available to you in the current file, enter  
"HELP COMMANDS" at an arrow prompt (=>).

=> s l34 and l35  
L36 26 L34 AND L35

=> d 1-26 all

L36 ANSWER 1 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 2005:1062684 CAPLUS  
 DN 143:351549  
 ED Entered STN: 05 Oct 2005  
 TI Water-based sulfur-containing composition chemical mechanical  
 polishing of nonferrous metals  
 IN Johns, Peter Gamon; Harrison, Clare Elizabeth  
 PA Middlesex Silver Co. Limited, UK  
 SO Brit. UK Pat. Appl., 29 pp.  
 CODEN: BAXXDU  
 DT Patent  
 LA English  
 IC ICM C23F011-16  
 ICS C23F011-00  
 CC 57-7 (Ceramics)  
 Section cross-reference(s): 56

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2412666	A	20051005	GB 2004-7163	20040330
	GB 2412666	B	20081008		
	AU 2005229275	A1	20051013	AU 2005-229275	20050324
	CA 2559989	A1	20051013	CA 2005-2559989	20050324
	WO 2005095675	A1	20051013	WO 2005-GB50043	20050324
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	EP 1730325	A1	20061213	EP 2005-718135	20050324
	R:	AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IS, IT, LI, LT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR			
	CN 1946878	A	20070411	CN 2005-80013434	20050324
	JP 2007537354	T	20071220	JP 2007-505641	20050324
	IN 2006DN05356	A	20070713	IN 2006-DN5356	20060915
	MX 2006010964	A	20061116	MX 2006-10964	20060925
	US 20070277906	A1	20071206	US 2007-594477	20070702
PRAI	GB 2004-7163	A	20040330		
	WO 2005-GB50043	W	20050324		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
GB 2412666	ICM	C23F011-16
	ICS	C23F011-00
	IPCI	C23F0011-10 [I,C]; C23F0011-16 [I,A]; C23F0011-00 [I,C]; C23F0011-00 [I,A]
	IPCR	C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-00 [I,C*]; C11D0003-00 [I,A]; C11D0003-34 [I,C*]; C11D0003-34 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]
	ECLA	C23F011/16; C23F011/16B
AU 2005229275	IPCI	C11D0003-00 [I,C*]; C09G0001-00 [I,C*]; C11D0003-34 [I,C*]; C11D0011-00 [I,C*]; C23F0011-10 [I,C*]; C11D0003-00 [I,A]; C09G0001-02 [I,A]; C11D0003-34 [I,A]; C11D0011-00 [I,A]; C23F0011-16 [I,A]
	IPCR	C11D0003-00 [I,C*]; C11D0003-00 [I,A]; C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-34 [I,C*];

		C11D0003-34 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
CA 2559989	ECLA	C23F011/16; C23F011/16B
	IPCI	C09G0001-02 [I,A]; C09G0001-00 [I,C*]; C11D0003-00 [I,A]; C11D0003-34 [I,A]; C11D0011-00 [I,A]; C23F0011-16 [I,A]; C23F0011-10 [I,C*]
	IPCR	C23F0011-10 [I,C]; C23F0011-16 [I,A]; C09G0001-00 [I,C]; C09G0001-02 [I,A]; C11D0003-00 [I,C]; C11D0003-00 [I,A]; C11D0003-34 [I,C]; C11D0003-34 [I,A]; C11D0011-00 [I,C]; C11D0011-00 [I,A]
	ECLA	C23F011/16; C23F011/16B
WO 2005095675	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]; C11D0003-00 [ICS,7]; C11D0003-34 [ICS,7]; C11D0011-00 [ICS,7]; C09G0001-02 [ICS,7]; C09G0001-00 [ICS,7,C*]
	IPCR	C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-00 [I,C*]; C11D0003-00 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
EP 1730325	IPCI	C23F0011-16 [I,A]; C23F0011-10 [I,C*]; C11D0003-00 [I,A]; C11D0003-34 [I,A]; C11D0011-00 [I,A]; C09G0001-02 [I,A]; C09G0001-00 [I,C*]
	IPCR	C23F0011-10 [I,C]; C23F0011-16 [I,A]; C09G0001-00 [I,C]; C09G0001-02 [I,A]; C11D0003-00 [I,C]; C11D0003-00 [I,A]; C11D0003-34 [I,C]; C11D0011-00 [I,A]
	ECLA	C23F011/16; C23F011/16B
CN 1946878	IPCI	C23F0011-16 [I,A]; C23F0011-10 [I,C*]; C11D0003-00 [I,A]; C11D0003-34 [I,A]; C11D0011-00 [I,A]; C09G0001-02 [I,A]; C09G0001-00 [I,C*]
	IPCR	C23F0011-10 [I,C]; C23F0011-16 [I,A]; C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-00 [I,C*]; C11D0003-00 [I,A]; C11D0003-34 [I,C*]; C11D0003-34 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]
	ECLA	C23F011/16; C23F011/16B
JP 2007537354	IPCI	C23C0022-58 [I,A]; C11D0003-34 [I,A]; C23C0022-68 [I,A]; C23C0022-05 [I,C*]; C11D0003-20 [I,A]; C11D0001-52 [I,A]; C11D0001-38 [I,C*]; C11D0001-72 [I,A]; C11D0001-79 [I,A]; C11D0001-755 [I,A]; C11D0001-75 [I,A]; C11D0001-722 [I,A]; C11D0001-14 [I,A]; C11D0001-02 [I,C*]; C11D0001-90 [I,A]; C11D0001-88 [I,C*]; C11D0003-04 [I,A]; C11D0001-68 [I,A]; C09K0003-14 [I,A]
	IPCR	C23C0022-05 [I,C]; C23C0022-58 [I,A]; C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C09K0003-14 [I,C]; C09K0003-14 [I,A]; C11D0001-02 [I,C]; C11D0001-14 [I,A]; C11D0001-38 [I,C]; C11D0001-52 [I,A]; C11D0001-68 [I,C]; C11D0001-68 [I,A]; C11D0001-72 [I,C]; C11D0001-72 [I,A]; C11D0001-722 [I,C]; C11D0001-722 [I,A]; C11D0001-75 [I,C]; C11D0001-75 [I,A]; C11D0001-755 [I,C]; C11D0001-755 [I,A]; C11D0001-79 [I,C]; C11D0001-79 [I,A]; C11D0001-88 [I,C]; C11D0001-90 [I,A]; C11D0003-00 [I,C*]; C11D0003-00 [I,A]; C11D0003-04 [I,C]; C11D0003-04 [I,A]; C11D0003-20 [I,C]; C11D0003-20 [I,A]; C11D0003-34 [I,C]; C11D0003-34 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23C0022-68 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	FTERM	4H003/AB27; 4H003/AC02; 4H003/AC10; 4H003/AC13; 4H003/AD04; 4H003/BA12; 4H003/DA15; 4H003/EA12; 4H003/EA19; 4H003/EB05; 4H003/EB18; 4H003/EB21; 4H003/ED02; 4H003/FA05; 4K026/AA01; 4K026/AA06;



4K026/CA15; 4K026/CA37; 4K026/DA02; 4K026/DA03

IN 2006DN05356 IPCI C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C\*]  
 MX 2006010964 IPCI C09G0001-02 [ICM,7]; C09G0001-00 [ICM,7,C\*];  
 C11D0011-00 [ICS,7]; C11D0003-00 [ICS,7]; C11D0003-34  
 [ICS,7]; C23F0011-16 [ICS,7]; C23F0011-10 [ICS,7,C\*]  
 US 20070277906 IPCI C23F0011-16 [I,A]; C23F0011-10 [I,C\*]; C09G0001-02  
 [I,A]; C09G0001-00 [I,C\*]; C11D0011-00 [I,A];  
 C11D0003-00 [I,A]; C11D0003-34 [I,A]  
 148/022.000

NCL

OS MARPAT 143:351549

AB A composition and associated method of manufacture of a water based  
 composition comprising a  
 treatment agent selected from an alkanethiol, alkyl thioglycollate, and  
 dialkyl sulfide or dialkyl disulfide. The composition also includes at least  
 one of an amphoteric, non-ionic or cationic surfactant, where the  
 treatment agent is directly dissolved or dispersed the water containing the  
 amphoteric, non-ionic or cationic surfactant. The composition is particularly  
 useful for the treatment of Ag-Cu-Ge alloy, copper, brass, and  
 nickel. A solid polishing medium can also be included in the  
 composition, for example, silica or precipitated chalk, alumina, or silica.

ST chalk alumina silica alkanethiol thioglycollate chem mech  
 polishing copper

IT Thiols, processes  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); TEM (Technical or engineered material use); PROC (Process); USES  
 (Uses)  
 (alkanethiol; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT Disulfides  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); TEM (Technical or engineered material use); PROC (Process); USES  
 (Uses)  
 (alkyl; water-based sulfur-containing composition chemical mech. polishing  
 of metals)

IT Chalk  
 Diatomite  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (as abrasive; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT Surfactants  
 (cationic; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT Polishing  
 (chemical-mech.; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT Polishing materials  
 (paste; water-based sulfur-containing composition chemical mech. polishing  
 of metals)

IT Thioethers  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); TEM (Technical or engineered material use); PROC (Process); USES  
 (Uses)  
 (water-based sulfur-containing composition chemical mech. polishing of  
 metals)

IT 1344-28-1, Alumina, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (abrasive; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT 9004-82-4, Sodium laureth sulfate  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (anionic surfactant; water-based sulfur-containing composition chemical  
 mech.

polishing of metals)

IT 7631-86-9, Silica, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (as abrasive; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT 36574-66-0D, N-coco acyl derivs.  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (cocamidopropyl betaine, surfactant; water-based sulfur-containing  
 composition  
 chemical mech. polishing of metals)

IT 7440-02-0, Nickel, processes 7440-50-8, Copper, processes 11144-43-7  
 12597-71-6, Brass, processes 74969-69-0  
 RL: PEP (Physical, engineering or chemical process); PYP (Physical  
 process); PROC (Process)  
 (polished substrate; water-based sulfur-containing composition chemical  
 mech. polishing of metals)

IT 62-56-6, Thiourea, uses 2885-00-9, Octadecyl mercaptan  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (polishing composition component; water-based sulfur-containing composition  
 chemical mech. polishing of metals)

IT 2917-26-2, Hexadecyl mercaptan  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (surfactant; water-based sulfur-containing composition chemical mech.  
 polishing of metals)

IT 68-11-1D, alkyl esters  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
 process); TEM (Technical or engineered material use); PROC (Process); USES  
 (Uses)  
 (water-based sulfur-containing composition chemical mech. polishing of  
 metals)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Anon; EP 0492487 A1 CAPLUS
- (2) Anon; GB 0956927 A
- (3) Anon; GB 1117510 A
- (4) Anon; US 3503883 A
- (5) Anon; US 3518098 A
- (6) Anon; US 5650385 A CAPLUS

L36 ANSWER 2 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 2004:1087508 CAPLUS

DN 142:489405

ED Entered STN: 20 Dec 2004

TI Reduction of silver tarnishing and protection against  
 subsequent corrosion

AU Bernard, M. C.; Dauvergne, E.; Evesque, M.; Keddad, M.; Takenouti, H.

CS UPR 15 of CNRS "Laboratoire Interfaces et Systemes Electrochimiques",  
 Universite P&M Curie, Paris, 75252, Fr.

SO Corrosion Science (2005), 47(3), 663-679

CODEN: CRRSAA; ISSN: 0010-938X

PB Elsevier Ltd.

DT Journal

LA English

CC 72-2 (Electrochemistry)

Section cross-reference(s): 28, 56, 66

AB The kinetics of tarnishing formation was examined on a  
 polished silver dipped in a 10 mM Na2S. The recovery of  
 an initial bright surface was then obtained by cathodic reduction of the  
 tarnish layer in a 5% sesqui-carbonate solution. Two protection  
 methods to prevent a further formation of a dark deposit were tested: an  
 electrodeposited poly(amino-triazole) film and the surface treatment in  
 hexadecane-thiol. The protection by poly(amino-triazole) is not reliable

for all nuances of silver. In contrast, the film formed with hexadecane-thiol showed satisfactory properties. The formations of tarnish and protective films were examined by electrochem. methods, the reflectance measurements, and the quartz crystal microbalance.

ST silver tarnishing protection polyaminotriazole thiol surface treatment electroredn; hexadecanethiol film silver tarnishing protection microbalance

IT Optical reflection  
(by silver during tarnishing reduction in sodium carbonate-bicarbonate solution)

IT Electric potential  
(during silver tarnishing in Na2S solution)

IT Polymerization  
(electrochem.; of 3-amino-1,2,4-triazole on silver for protection of tarnishing)

IT Corrosion kinetics  
(kinetics of tarnishing formation on polished silver dipped in 10 mM Na2S)

IT Adsorption  
(of hexadecanethiol on silver surface for protection of tarnishing)

IT Cyclic voltammetry  
(of silver in sodium acetate methanol solution containing amino-triazole)

IT Reduction, electrochemical  
(of silver tarnishing and protection against subsequent corrosion)

IT Voltammetry  
(of silver tarnishing reduction in sodium carbonate-bicarbonate solution)

IT Surface treatment  
(protection of silver tarnishing using hexadecane-thiol)

IT Microbalances  
(quartz crystal; study of silver tarnishing reduction in sodium carbonate-bicarbonate solution using)

IT Corrosion prevention  
Tarnishing  
(reduction of silver tarnishing and protection against subsequent corrosion)

IT 67-56-1, Methanol, uses 127-09-3, Sodium acetate  
RL: NUU (Other use, unclassified); USES (Uses)  
(cyclic voltammetry of silver in sodium acetate methanol solution containing amino-triazole)

IT 61-82-5, 3-Amino-1,2,4-triazole  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(electropolymn. on silver for protection of tarnishing)

IT 1313-82-2, Sodium sulfide, reactions  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(kinetics of tarnishing formation on polished silver dipped in 10 mM Na2S)

IT 2917-26-2, Hexadecane-thiol  
RL: NUU (Other use, unclassified); USES (Uses)  
(protection of silver tarnishing using)

IT 7440-22-4, Silver, uses  
RL: CPS (Chemical process); DEV (Device component use); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent); USES (Uses)  
(reduction of silver tarnishing and protection against

subsequent corrosion)

IT 151313-83-6P, Poly(3-amino-1,2,4-triazole)

RL: NUU (Other use, unclassified); PNU (Preparation, unclassified); PREP (Preparation); USES (Uses)

(silver protection of tarnishing using film of)

IT 533-96-0, Sodium sesqui-carbonate

RL: NUU (Other use, unclassified); USES (Uses)

(voltammetry of silver tarnishing reduction in sodium carbonate-bicarbonate solution)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Burleigh, T; Corrosion 2001, V57(12), P1066 CAPLUS

(2) Degrigny, C; Corrosion Australasia 1993, V18, P16 CAPLUS

(3) Degrigny, C; J Int Inst Conservat Historic Artistic Works 1995, P170

(4) Evesque, M; Electrochim Acta 2004, V49, P2939

(5) Keddad, M; 15th International Corrosion Congress, CD-Rom Proceedings 2002, 701

(6) Trachli, B; Corros Sci 2002, V44, P997 CAPLUS

L36 ANSWER 3 OF 26 CAPLUS COPYRIGHT 2009 ACS ON STN

AN 2004:1051670 CAPLUS

DN 142:26523

ED Entered STN: 08 Dec 2004

TI Silver-germanium-copper alloy for decorative utensils with a tarnish-preventing treatment

IN Johns, Peter Gamon

PA Middlesex Silver Co. Limited, UK; Cole, Paul Gilbert

SO Brit. UK Pat. Appl., 26 pp.

CODEN: BAXXDU

DT Patent

LA English

IC ICM C22C005-08

ICS C11D003-34; C22C005-06; C23C022-02

CC 56-3 (Nonferrous Metals and Alloys)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 2402399	A	20041208	GB 2003-12693	20030603
	GB 2402399	B	20051012		
	US 20070009375	A1	20070111	US 2004-559092	20030601
	AU 2004243654	A1	20041209	AU 2004-243654	20040601
	CA 2527430	A1	20041209	CA 2004-2527430	20040601
	WO 2004106567	A1	20041209	WO 2004-GB2317	20040601
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	EP 1631692	A1	20060308	EP 2004-735594	20040601
	EP 1631692	B1	20090114		
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, FI, RO, CY, TR, BG, CZ, EE, HU, PL, SK			
	CN 1846007	A	20061011	CN 2004-80015410	20040601
	JP 2007535616	T	20071206	JP 2006-508380	20040601
	AT 420980	T	20090115	AT 2004-735594	20040601
	IN 2005DN05033	A	20070817	IN 2005-DN5033	20051103

MX 2005012991	A	20060720	MX 2005-12991	20051201
PRAI GB 2003-12693	A	20030603		
WO 2004-GB2317	W	20040601		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
GB 2402399	ICM	C22C005-08
	ICS	C11D003-34; C22C005-06; C23C022-02
	IPCI	C22C0005-08 [ICM,7]; C11D0003-34 [ICS,7]; C22C0005-06 [ICS,7]; C23C0022-02 [ICS,7]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
US 20070009375	IPCI	C22C0005-08 [I,A]; C22C0005-06 [I,C*]
	NCL	420/502.000
	ECLA	C23F011/16; C23F011/16B
AU 2004243654	IPCI	C22C0005-06 [ICM,7]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
CA 2527430	IPCI	C22C0005-06 [I,A]
	IPCR	C22C0005-06 [I,A]; C22C0005-06 [I,C]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
WO 2004106567	IPCI	C22C0005-06 [ICM,7]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
EP 1631692	IPCI	C22C0005-06 [I,C]; C22C0005-06 [I,A]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
CN 1846007	IPCI	C22C0005-06 [I,A]
	IPCR	C22C0005-06 [I,C]; C22C0005-06 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
JP 2007535616	IPCI	C22C0005-06 [I,A]; C23C0022-02 [I,A]; C23G0005-02 [I,A]; C23G0005-00 [I,C*]; C22F0001-14 [N,A]; C22F0001-00 [N,A]
	IPCR	C22C0005-06 [I,C]; C22C0005-06 [I,A]; C22F0001-00 [N,C]; C22F0001-00 [N,A]; C22F0001-14 [N,C]; C22F0001-14 [N,A]; C23C0022-02 [I,C]; C23C0022-02 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]; C23G0005-00 [I,C]; C23G0005-02 [I,A]
	ECLA	C23F011/16; C23F011/16B
	FTERM	4K026/AA01; 4K026/BA01; 4K026/BB01; 4K026/BB08; 4K026/CA02; 4K053/PA01; 4K053/PA13; 4K053/QA07; 4K053/RA08; 4K053/RA54; 4K053/SA02; 4K053/SA06; 4K053/ZA01
AT 420980	IPCI	C22C0005-06 [I,C]; C22C0005-06 [I,A]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16; C23F011/16B
IN 2005DN05033	IPCI	C22C0005-06 [ICM,7]
MX 2005012991	IPCI	C22C0005-06 [ICM,7]

AB The decorative alloy contains 93.5-95.5% Ag, 0.5-3% Ge by weight, and Cu as the balance, optionally with 1-40 ppm of B as the grain refiner. The typical alloy contains Ag 94.5, Cu 4.3, and Ge 1.2%, and is suitable for strip manufacture by continuous casting followed by cold rolling with intermediate annealing. The polished surface of manufactured Ag-alloy articles is treated for tarnish resistance with an alkanethiol, alkyl thioglycollate, dialkyl sulfide, or dialkyl disulfide, especially stearyl mercaptan, cetyl mercaptan (octadecyl mercaptan), stearyl thioglycollate, or cetyl thioglycollate. The S-containing mols. are optionally dissolved in: (a) organic solvent (especially Pr bromide), and applied as a polish or impregnated into a cleaning cloth; or (b) organic

solvent modified by adding concentrated aqueous soap or detergent. The resulting

mixture are optionally diluted with water for the tarnish-preventing treatment.

ST silver copper germanium alloy utensil tarnish prevention thiol treatment

IT Metalworking

(Ag-alloy; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT Tarnishing

(prevention, on Ag alloy; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT Detergents

(tarnish prevention with, on Ag alloy; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT Thioethers

Thiols, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(tarnish prevention with, on Ag alloy; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT 7440-42-8, Boron, uses

RL: MOA (Modifier or additive use); USES (Uses)  
(Ag alloy containing; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT 802919-79-5

RL: TEM (Technical or engineered material use); USES (Uses)  
(alloying of; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT 802919-80-8

RL: TEM (Technical or engineered material use); USES (Uses)  
(decorative; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT 68-11-1D, alkylated

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)

(tarnish prevention with; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

IT 106-94-5, n-Propyl bromide

RL: TEM (Technical or engineered material use); USES (Uses)  
(tarnish prevention with; Ag-Ge-Cu alloy for decorative polished utensils with tarnish-preventing treatment)

RE.CNT 8 THERE ARE 8 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

- (1) Asada; US 5972131 A CAPLUS
- (2) Goddard; GB 1130540 A
- (3) Goddard; GB 1217414 A CAPLUS
- (4) Johns; WO 02095082 A2 CAPLUS
- (5) Johns; GB 2283933 A
- (6) Johns; US 6168071 B1 CAPLUS
- (7) Metaleurop; GB 2255348 A CAPLUS
- (8) Murphey; US 2841501 A

L36 ANSWER 4 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 2004:847649 CAPLUS

DN 141:353637

ED Entered STN: 15 Oct 2004

TI Pretreatment of Ag-alloy surface with organosulfur compounds for  
tarnishing prevention  
IN Johns, Peter Gammon; Harrison, Clare Elizabeth  
PA Middlesex Silver Co. Limited, UK  
SO PCT Int. Appl., 43 pp.  
CODEN: PIXXD2  
DT Patent  
LA English  
IC ICM C23F011-16  
CC 56-6 (Nonferrous Metals and Alloys)  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2004087996	A1	20041014	WO 2004-GB1373	20040330
	W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW			
	RW:	BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG			
	AU 2004225693	A1	20041014	AU 2004-225693	20040330
	CA 2520807	A1	20041014	CA 2004-2520807	20040330
	EP 1611267	A1	20060104	EP 2004-724313	20040330
	R:	AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, HU, PL, SK			
	CN 1780937	A	20060531	CN 2004-80011375	20040330
	JP 2006523266	T	20061012	JP 2006-506057	20040330
	IN 2005DN04346	A	20070831	IN 2005-DN4346	20050926
	MX 2005010452	A	20060510	MX 2005-10452	20050928
	US 20070039665	A1	20070222	US 2005-551476	20050929
PRAI	GB 2003-7290	A	20030331		
	WO 2004-GB1373	W	20040330		

CLASS	PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 2004087996	ICM	C23F011-16	
	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]	
	ECLA	C23F011/16; C23F011/16B	
AU 2004225693	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]	
	ECLA	C23F011/16; C23F011/16B	
CA 2520807	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]	
	ECLA	C23F011/16; C23F011/16B	
EP 1611267	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]	
	ECLA	C23F011/16; C23F011/16B	
CN 1780937	IPCI	C23F0011-16 [I,A]; C23F0011-10 [I,C*]	
	ECLA	C23F011/16; C23F011/16B	
JP 2006523266	IPCI	C23F0011-00 [I,A]; C22C0005-06 [I,A]; C22C0005-08 [I,A]	
	IPCR	C23F0011-00 [I,C]; C23F0011-00 [I,A]; C22C0005-06 [I,C]; C22C0005-06 [I,A]; C22C0005-08 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]	
	FTERM	4K062/AA01; 4K062/BB21; 4K062/BC22; 4K062/FA16	
IN 2005DN04346	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	
MX 2005010452	IPCI	C23F0011-16 [ICM,7]; C23F0011-10 [ICM,7,C*]	

ECLA C23F011/16; C23F011/16B  
 US 20070039665 IPCI C23G0001-00 [I,A]; C23C0022-58 [I,A]; C23C0022-05 [I,C\*]  
 NCL 148/271.000; 134/002.000

AB The Ag alloys containing minor Ge (especially Ag-Cu-Ge alloys) to decrease the fire stain discoloration are pretreated on the surface with an alkanethiol, alkyl thioglycollate, dialkyl sulfide, or dialkyl disulfide to prevent tarnishing. The treatment with organosulfur compds. is suitable for manufactured Ag-alloy articles to prevent tarnished appearance during transit and the subsequent extended display without special packaging. The Ag-alloy surface is optionally treated with aqueous solution containing an alkanethiol, alkyl thioglycollate, dialkyl sulfide, or dialkyl disulfide, as well as a mixture of anionic surfactant and amphoteric or nonionic surfactant to solubilize the treatment agent. The typical ternary alloy contains Ag 80-96, Cu 1-19.9, and Ge 0.1-5%.

ST silver copper germanium alloy tarnishing prevention  
 organosulfur

IT Surfactants  
 (anionic, in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Surfactants  
 (in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Surfactants  
 (nonionic, in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Tarnishing  
 (prevention of; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT Thioethers  
 Thiols, uses  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (tarnishing prevention by; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 7440-56-4, Germanium, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (Ag alloys containing, tarnishing prevention on; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 106-94-5, n-Propyl bromide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (solvent, in tarnishing prevention; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 2885-00-9, Octadecyl mercaptan 2917-26-2, Cetyl mercaptan  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (tarnishing prevention by; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 39282-03-6, Sterling silver 103221-24-5 476614-10-5 476614-12-7 476614-13-8  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process)  
 (tarnishing prevention on; Ag-alloy surface treated with organosulfur compds. for tarnishing prevention)

IT 9080-17-5, Ammonium polysulfide  
 RL: CPS (Chemical process); PEP (Physical, engineering or chemical



process); PROC (Process)  
 (test solution with, for tarnishing; Ag-alloy surface  
 treated with organosulfur compds. for tarnishing prevention)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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 (1) Carlton, C; US 3503883 A 1970  
 (2) Carpenter, J; US 3398003 A 1968 CAPLUS  
 (3) Gamon, J; EP 0729398 A 1996 CAPLUS  
 (4) Gamon, J; WO 02095082 A 2002 CAPLUS  
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L36 ANSWER 5 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN  
 AN 2004:396797 CAPLUS  
 DN 141:113055  
 ED Entered STN: 17 May 2004  
 TI The formation of self-assembling membrane of hexadecane-thiol on  
 silver to prevent the tarnishing  
 AU Evesque, Magali; Keddad, Michel; Takenouti, Hisasi  
 CS Laboratoires Interface et Systemes Electrochimiques, UPR15 du CNRS, Pierre  
 et Marie Curie University, Paris, 75252, Fr.  
 SO Electrochimica Acta (2004), 49(17-18), 2937-2943  
 CODEN: ELCAAV; ISSN: 0013-4686  
 PB Elsevier Science B.V.  
 DT Journal  
 LA English  
 CC 72-6 (Electrochemistry)  
 Section cross-reference(s): 56

AB Artifacts in Ag suffer from tarnishing when exposed to  
 atms. polluted by sulfide. The authors found the optimum conditions to  
 form an efficient, invisible and protective film against the  
 tarnishing appearance on Ag in 0.5M NaCl solution containing 10  
 mM Na2S. This solution corresponds to a highly aggressive medium not only by  
 the coupling of 2 aggressive agents, but also by a high concentration of S2-  
 (320  
 ppm). The Ag surface was 1st degreased carefully by successive  
 dippings in 3 organic solvents, EtOH, acetone and hexane, followed by a  
 slight surface activation in H2SO4 solution. Then, a Ag specimen  
 was immersed in an isoPrOH solution with 0.15M Cl6H33SH during 1 h at  
 30°. The kinetics of tarnishing was tracked by  
 reflectance, quartz-microbalance measurements, and electrochem. impedance  
 spectroscopy. The protection of hexadecane-thiol reaches 90% in terms of  
 reflectance, after 1 h of corrosion test, i.e., no alteration by visual  
 inspection. The thiol film has a double structure, an inner  
 self-assembling membrane of 1 or 2 monolayers and an outer-layer with some  
 tenths micrometers. This surface film limits markedly the diffusion of  
 dissolved oxygen to the electrode surface, thus slows down the rate of  
 Ag sulfide (Ag2S) formation.

ST self assembling membrane formation hexadecanethiol silver  
 tarnishing prevention  
 IT Adsorbed substances  
 (corrosion of silver with and without adsorbed  
 hexadecanethiol in NaCl containing Na2S in tarnishing prevention  
 study)  
 IT Microbalances  
 (electrochem. quartz crystal; in corrosion and characterization study  
 of hexadecanethiol adsorbed film on silver in NaCl containing  
 Na2S)  
 IT Adsorption

(hexadecanethiol by Ag in isoPrOH solution containing hexadecanethiol)

IT Electric impedance  
(in corrosion study of hexadecanethiol adsorbed film on silver in NaCl containing Na2S)

IT Corrosion  
(of silver with and without adsorbed hexadecanethiol in NaCl containing Na2S in tarnishing prevention study)

IT Tarnishing  
(prevention by hexadecanethiol film formed by immersion of Ag in isoPrOH solution containing hexadecanethiol)

IT 1313-82-2, Sodium sulfide (Na2S), uses 7647-14-5, Sodium chloride, uses RL: CPS (Chemical process); NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process); USES (Uses)  
(elec. impedance and electrochem. quartz crystal microbalance study of hexadecanethiol adsorbed film on silver in NaCl containing Na2S in tarnishing prevention study)

IT 2917-26-2, Hexadecanethiol  
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PRP (Properties); PYP (Physical process); PROC (Process); USES (Uses)  
(formation of self-assembling membrane of hexadecanethiol on silver to prevent tarnishing in electrochem. quartz crystal microbalance and impedance study)

IT 7440-22-4, Silver, properties  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(tarnishing prevention by hexadecanethiol film formed by immersion of Ag in isoPrOH solution containing hexadecanethiol)

RE.CNT 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L36 ANSWER 6 OF 26 CAPLUS COPYRIGHT 2009 ACS ON STN  
AN 2002:49041 CAPLUS  
DN 136:187483  
ED Entered STN: 18 Jan 2002  
TI Self-assembled monolayers of perfluoroalkyl amideethanethiols, fluoroalkylthiols, and alkylthiols for the prevention of silver tarnish  
AU Burleigh, T. D.; Shi, C.; Kilic, S.; Kovacic, S.; Thompson, T.; Enick, R. M.  
CS Department of Materials Science and Engineering, University of Pittsburgh, Pittsburgh, PA, 15261, USA  
SO Corrosion (Houston, TX, United States) (2002), 58(1), 49-56  
CODEN: CORRAK; ISSN: 0010-9312  
PB NACE International  
DT Journal  
LA English  
CC 56-10 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 42  
AB Self-assembled monolayers (SAM) of perfluoroalkyl amideethanethiols. F(CF2)nCONH(CH2)2SH (n = 6, 7, or 8), inhibit the corrosion of silver by hydrogen sulfide (H2S) in air. Unlike conventional hydrocarbon thiols used to protect silver from corrosion, these fluorinated amideethiols have a very low mercaptan odor, impart

fluorocarbon wettability properties to the silver surfaces, and exhibit intermol. assocns. via hydrogen bonding of the amide functionality. These fluorinated thiols were synthesized by reacting fluoroalkyl acid chloride with 2-aminoethanethiol, or by reacting Me fluoroalkanoate with 2-aminoethanethiol. SAM were formed by immersing silver coupons in 0.01, 0.1, and 1 wt% solns. of the fluorinated amidethiol in propanol (CH<sub>3</sub>CH<sub>2</sub>CH<sub>2</sub>OH), or by applying a thin film of the thiol solution that rapidly evaporated Electrochem. impedance spectroscopy

(EIS)

was used to evaluate the thickness and integrity of the monolayers. The thin films of evaporating thiol solution yielded rapid monolayer formation as a result of the increasing concentration of the thiol in the solution on the silver during the evaporation of the propanol. Accelerated tarnish tests were performed in a chamber that exposed the silver to air, water vapor, and 1 ppm H<sub>2</sub>S for 7 h to 24 h at 313 K. The tarnish resistances associated with a fluoroalkyl thiol (1= 1H,2H,2H- perfluorodecyl-1-thiol) and hexadecanethiol were also determined The best tarnish resistance was attained with the hexadecanethiol, and the perfluoroalkylamide ethanethiol yielded better corrosion resistance results than the fluoroalkylthiol.

ST

tarnishing protection silver hexadecanethiol

IT

Corrosion prevention

Films

Self-assembly

Tarnishing

(self-assembled monolayers for the prevention of silver tarnish)

IT

Thiols, reactions

RL: RCT (Reactant); TEM (Technical or engineered material use); RACT (Reactant or reagent); USES (Uses)

(self-assembled monolayers for the prevention of silver tarnish)

IT

7440-22-4, Silver, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); TEM (Technical or engineered material use); PROC (Process); RACT (Reactant or reagent); USES (Uses)

(self-assembled monolayers for the prevention of silver tarnish)

IT

2917-26-2, Hexadecanethiol 7783-06-4, Hydrogen sulfide, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); TEM (Technical or engineered material use); PROC (Process); RACT (Reactant or reagent); USES (Uses)

(self-assembled monolayers for the prevention of silver tarnish)

IT

95612-22-9 115281-11-3 192137-69-2

RL: TEM (Technical or engineered material use); USES (Uses)

(self-assembled monolayers for the prevention of silver tarnish)

RE.CNT

19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L36 ANSWER 7 OF 26 CAPLUS COPYRIGHT 2009 ACS ON STN

AN 2001:905959 CAPLUS

DN 136:89158

ED Entered STN: 16 Dec 2001

TI Tarnish protection of silver using a hexadecanethiol self-assembled monolayer and descriptions of accelerated tarnish tests

AU Burleigh, T. D.; Gu, Y.; Donahey, G.; Vida, M.; Waldeck, D. H.  
CS Department of Materials Science and Engineering, University of Pittsburgh, Pittsburgh, PA, 15261, USA

SO Corrosion (Houston, TX, United States) (2001), 57(12), 1066-1074  
CODEN: CORRAK; ISSN: 0010-9312

PB NACE International

DT Journal

LA English

CC 56-10 (Nonferrous Metals and Alloys)

AB A four-step procedure was developed for depositing a hexadecanethiol self-assembled monolayer (SAM) onto the surface of silver to provide tarnish resistance. The four steps may be characterized as cleaning, etching, monolayer self-assembly, and rinsing. A key observation in this work is that an optimal deposition time exists for a given concentration of the hexadecanethiol. For example, a 2 vol% solution (2

mL hexadecanethiol in 98 mL trichloroethylene) required 30 min to 60 min for optimum coating formation. The quality of the coatings was characterized using water drop contact angle measurements and electrochem. impedance spectroscopy (EIS). In addition, two tarnish tests were developed specifically for this project. One test was a laboratory bench vapor test that could tarnish silver, copper, or brass to a dark color within a few hours. A second test exposed the silver to a stream of a sulfide-containing foam and could tarnish silver to black within several minutes. The degree of tarnishing from these two tests was quantified by measuring the% reflectance of the surface using visible light.

ST tarnish protection silver hexadecanethiol

IT Tarnishing

(tarnish protection of silver using a hexadecanethiol self-assembled monolayer and descriptions of accelerated tarnish tests)

IT 7440-22-4, Silver, processes

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); PRP (Properties); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)

(tarnish protection of silver using a hexadecanethiol self-assembled monolayer and descriptions of accelerated tarnish tests)

IT 2917-26-2, Hexadecanethiol

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(tarnish protection of silver using a hexadecanethiol self-assembled monolayer and descriptions of

accelerated tarnish tests)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD  
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L36 ANSWER 8 OF 26 CAPLUS COPYRIGHT 2009 ACS ON STN

AN 2000:83978 CAPLUS

DN 132:172522

ED Entered STN: 04 Feb 2000

TI Electrochemical Cleaning of Surface-Confined Carbon Contamination in Self-Assembled Monolayers on Polycrystalline Ag and Au

AU Schoenfish, Mark H.; Ross, Azalia M.; Pemberton, Jeanne E.

CS Department of Chemistry, University of Arizona, Tucson, AZ, 85721, USA

SO Langmuir (2000), 16(6), 2907-2914

CODEN: LANGD5; ISSN: 0743-7463

PB American Chemical Society

DT Journal

LA English

CC 72-2 (Electrochemistry)

Section cross-reference(s): 66, 73

AB A protocol for electrochem. cleaning of carbon-contaminated alkanethiol SAMs at mech. polished (MP) Ag surfaces was characterized by surface Raman spectroscopy and electrochem. Vibrational information in the  $\nu(\text{C-S})$ ,  $\nu(\text{C-C})$ ,  $\nu(\text{C-H})$ , and  $\delta(\text{C-H})$  regions is particularly useful in elucidating the degree of order and amount of contamination in propanethiol, dodecanethiol, and octadecanethiol monolayers before and after neg. potential exposure in several aqueous electrolytes. Specifically, Raman spectra indicate that electrochem. cleaning of alkanethiol SAMs at potentials neg. of the thiolate reduction removes carbonaceous species and greatly increases the film order near the sulfur headgroup.

ST electrochem cleaning surface confined carbon contamination self assembled monolayer; polycryst silver gold self assembled monolayer carbon contamination electrocleaning; Raman spectra alkanethiol self assembled monolayer gold silver

IT Thiols (organic), properties

RL: PEP (Physical, engineering or chemical process); PRP (Properties);

PROC (Process)

- (electrochem. cleaning of surface-confined carbon contamination in alkanethiol self-assembled monolayers on polycryst. Ag and Au)
- IT Self-assembled monolayers  
(electrochem. cleaning of surface-confined carbon contamination in self-assembled monolayers on polycryst. Ag and Au)
- IT Desorption  
(electrochem.; of alkanethiol with contamination removal: electrochem. cleaning of surface-confined carbon contamination in self-assembled monolayers on polycryst. Ag)
- IT Cleaning  
(electrochem.; of surface-confined carbon contamination in self-assembled monolayers on polycryst. Ag and Au)
- IT Electric potential  
(neg.; in alkanethiol desorption and contamination removal: electrochem. cleaning of surface-confined carbon contamination in self-assembled monolayers on polycryst. Ag and Au)
- IT Cyclic voltammetry  
(of Ru(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup> in KCl at alkanethiol self-assembled monolayers on Ag before and after neg. potential application and electrochem. cleaning)
- IT Raman spectra  
(of dodecanethiol and octadecanethiol and propanethiol self-assembled monolayers on Ag and Au: electrochem. cleaning of surface-confined carbon contamination in propanethiol self-assembled monolayers on polycryst. Ag and Au)
- IT 7447-40-7, Potassium chloride (KCl), uses  
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
(cyclic voltammetry of Ru(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup> in KCl at alkanethiol self-assembled monolayers on Ag before and after neg. potential application and electrochem. cleaning)
- IT 18943-33-4, Hexaammineruthenium(3+)  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(cyclic voltammetry of Ru(NH<sub>3</sub>)<sub>6</sub><sup>3+</sup> in KCl at alkanethiol self-assembled monolayers on Ag before and after neg. potential application and electrochem. cleaning)
- IT 7681-49-4, Sodium fluoride, uses  
RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)  
(electrochem. cleaning of surface-confined carbon contamination in alkanethiol self-assembled monolayers on polycryst. Ag in solution of)
- IT 1322-36-7, Dodecanethiol  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(electrochem. cleaning of surface-confined carbon contamination in dodecanethiol self-assembled monolayers on polycryst. Ag and Au)
- IT 2885-00-9, Octadecanethiol  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(electrochem. cleaning of surface-confined carbon contamination in octadecanethiol self-assembled monolayers on polycryst. Ag and Au)
- IT 79869-58-2, Propanethiol  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(electrochem. cleaning of surface-confined carbon contamination in propanethiol self-assembled monolayers on polycryst. Ag and Au)
- IT 7440-22-4, Silver, uses 7440-57-5, Gold, uses  
RL: DEV (Device component use); PRP (Properties); USES (Uses)  
(electrochem. cleaning of surface-confined carbon contamination in

self-assembled monolayers on polycryst. Ag and Au)

IT 7440-44-0, Carbon, properties  
 RL: OCU (Occurrence, unclassified); PEP (Physical, engineering or chemical process); PRP (Properties); OCCU (Occurrence); PROC (Process)  
 (electrochem. cleaning of surface-confined carbon contamination in self-assembled monolayers on polycryst. Ag and Au)

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L36 ANSWER 9 OF 26 CAPLUS COPYRIGHT 2009 ACS ON STN

AN 2000:83975 CAPLUS

DN 132:199505

ED Entered STN: 04 Feb 2000

TI Sequestration of carbonaceous species within alkanethiol self-assembled monolayers on Ag by Raman spectroscopy

AU Taylor, Chad E.; Schoenfish, Mark H.; Pemberton, Jeanne E.

CS Department of Chemistry, University of Arizona, Tucson, AZ, 85721, USA

SO Langmuir (2000), 16(6), 2902-2906

CODEN: LANGD5; ISSN: 0743-7463

PB American Chemical Society

DT Journal

LA English

CC 66-4 (Surface Chemistry and Colloids)

AB Raman spectra of hydrogenated CnSH (where, n = 3-5, 8, 9, 12, and 18) and C8D17SH SAMs at mech. polished (MP) Ag indicate monolayer contamination by a small polyarom. hydrocarbon (PAH). The

contaminant source at the unmodified MP Ag surface is identified using Raman spectroscopy, and thus, the contaminant is believed to be placed at this surface during the mech. polishing procedure. Notably, the PAH contaminant is not completely removed by either solvent dissoln. or alkanethiol adsorption, suggesting that it is strongly bound, and more significantly, sequestered within the alkanethiol SAM.

Controlled incorporation of pyrene into dodecanethiol SAMs demonstrates that doping of alkanethiol SAMs may be possible for certain systems.

- ST alkanethiol self assembled monolayer silver PAH contaminant sequestration
- IT Polycyclic compounds  
Polycyclic compounds  
RL: MOA (Modifier or additive use); USES (Uses)  
(aromatic hydrocarbons; sequestration of PAH contaminant within alkanethiol self-assembled monolayers on Ag)
- IT Aromatic hydrocarbons, uses  
Aromatic hydrocarbons, uses  
RL: MOA (Modifier or additive use); USES (Uses)  
(polycyclic; sequestration of PAH contaminant within alkanethiol self-assembled monolayers on Ag)
- IT Self-assembled monolayers  
(sequestration of PAH contaminant within alkanethiol self-assembled monolayers on Ag)
- IT Thiols (organic), properties  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(sequestration of PAH contaminant within alkanethiol self-assembled monolayers on Ag)
- IT Complexation  
(sequestration; of PAH contaminant within alkanethiol self-assembled monolayers on Ag)
- IT 129-00-0, Pyrene, processes  
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(model contaminant; sequestration of PAH contaminant within dodecanol self-assembled monolayers on Ag)
- IT 7440-22-4, Silver, processes  
RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(sequestration of PAH contaminant within alkanethiol self-assembled monolayers on)
- IT 109-79-5, Butanethiol 110-66-7, Pentanethiol 1322-36-7, Dodecanethiol 2885-00-9, Octadecanethiol 79869-58-2, Propanethiol 94805-33-1, Octanethiol  
RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)  
(sequestration of PAH contaminant within alkanethiol self-assembled monolayers on Ag)

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L36 ANSWER 10 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1999:819549 CAPLUS

DN 132:67594

ED Entered STN: 30 Dec 1999

TI Aliphatic alcohol for inhibiting tarnish formation in cleaning  
of silver surfaces with ether stabilized, n-propyl bromide  
solvent systems

IN Shubkin, Ronald L.

PA Albemarle Corp., USA

SO PCT Int. Appl., 14 pp.

CODEN: PIXXD2

DT Patent

LA English

IC ICM C23G005-028

ICS C11D007-50

CC 56-10 (Nonferrous Metals and Alloys)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9967445	A1	19991229	WO 1999-US12965	19990609
W: CA, JP, KR				
RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
CA 2333496	A1	19991229	CA 1999-2333496	19990609
EP 1090164	A1	20010411	EP 1999-928514	19990609
EP 1090164	B1	20031217		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
JP 2002519506	T	20020702	JP 2000-556083	19990609
AT 256767	T	20040115	AT 1999-928514	19990609
PRAI US 1998-104898	A	19980625		

WO 1999-US12965

W

19990609

## CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
WO 9967445	ICM ICS IPCI IPCR ECLA	C23G0005-028 C11D0007-50 C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6] C11D0007-22 [I,C*]; C11D0007-26 [I,A]; C11D0007-30 [I,A]; C11D0007-32 [I,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A] C11D007/26A; C11D011/00B2D8; C11D011/00B10; C23G005/028; C11D007/26C; C11D007/32C; C11D007/50A; C11D011/00B2D2
CA 2333496	IPCI IPCR ECLA	C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6] C11D0007-22 [I,C*]; C11D0007-26 [I,A]; C11D0007-30 [I,A]; C11D0007-32 [I,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A] C11D007/26A; C11D007/26C; C11D007/32C; C11D007/50A; C11D011/00B2D2; C11D011/00B2D8; C11D011/00B10; C23G005/028
EP 1090164	IPCI IPCR ECLA	C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6] C11D0007-22 [I,C*]; C11D0007-26 [I,A]; C11D0007-30 [I,A]; C11D0007-32 [I,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A] C11D007/26A; C11D007/26C; C11D007/32C; C11D007/50A; C11D011/00B2D2; C11D011/00B2D8; C11D011/00B10; C23G005/028
JP 2002519506	IPCI IPCR	C23G0005-028 [ICM,7]; C23G0005-00 [ICM,7,C*]; C11D0007-26 [ICS,7]; C11D0007-30 [ICS,7]; C11D0007-22 [ICS,7,C*]; C11D0007-50 [ICS,7] C11D0007-22 [I,C*]; C11D0007-26 [I,A]; C11D0007-30 [I,A]; C11D0007-32 [I,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]
AT 256767	IPCI ECLA	C23G0005-028 [ICM,7]; C23G0005-00 [ICM,7,C*]; C11D0007-50 [ICS,7] C11D007/26A; C11D007/26C; C11D007/32C; C11D007/50A; C11D011/00B2D2; C11D011/00B2D8; C11D011/00B10; C23G005/028
AB	The tarnishing of Ag surface in cleaning with an ether-stabilized Pr bromide solution is inhibited by adding a saturated aliphatic C1-10 alc. at 0.1-15%. The resulting bath is suitable for cleaning of Ag-coated electronic parts, and typically contains the Pr bromide at ≥80, ether (especially 1,3-dioxolane) as the stabilizer and metal passivator at 1.5-2.5, and the alc. (typically 1-propanol) 1.5-3.5%. The stabilized bath for vapor-type cleaning of Ag-coated steel strip contains 1,3-dioxolane 1.50, 1,2-epoxybutane 0.50, nitromethane 0.50, and 1-propanol 3.50%, vs. dark tarnish in 10-min test at 71°	
ST	in the similar bath containing 4.0% 1,3-dioxolane with no 1-propanol. silver tarnish prevention cleaning propyl bromide solvent; aliph alc inhibitor tarnish silver cleaning bath	
IT	Alcohols, uses RL: MOA (Modifier or additive use); USES (Uses) (aliphatic, C1-10, cleaning bath containing; aliphatic alc. as tarnish	

inhibitor in stable solvent bath for cleaning of silver surface)

IT Ethers, uses  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (cyclic, stabilizer, cleaning bath containing; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

IT Tarnishing  
 (on silver; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

IT Electric contacts  
 (silver-coated, cleaning of; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

IT 67-63-0, 2-Propanol, uses 71-23-8, 1-Propanol, uses 71-36-3, 1-Butanol, uses 75-52-5, Nitromethane, uses 75-65-0, tert-Butanol, uses 75-85-4, 1,1-Dimethylpropan-1-ol 78-83-1, 2-Methylpropan-1-ol, uses 78-92-2, 2-Butanol 106-88-7, 1,2-Epoxybutane 137-32-6, 2-Methylbutan-1-ol 598-75-4, 1,2-Dimethylpropan-1-ol 646-06-0, 1,3-Dioxolane  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (cleaning bath containing; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

IT 106-94-5, n-Propyl bromide  
 RL: TEM (Technical or engineered material use); USES (Uses)  
 (cleaning bath; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

IT 7440-22-4, Silver, processes  
 RL: PEP (Physical, engineering or chemical process); PROC (Process)  
 (cleaning of; aliphatic alc. as tarnish inhibitor in stable solvent bath for cleaning of silver surface)

RE.CNT 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD  
 RE

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L36 ANSWER 11 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1999:748299 CAPLUS  
 DN 131:352890  
 ED Entered STN: 25 Nov 1999  
 TI Acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, n-propyl bromide-based solvent systems and cleaning electronic parts  
 IN Shubkin, Ronald L.  
 PA Albemarle Corporation, USA  
 SO U.S., 4 pp.  
 CODEN: USXXAM  
 DT Patent  
 LA English  
 IC ICM C11D003-24  
 ICS C11D003-43  
 INCL 510412000

CC 46-6 (Surface Active Agents and Detergents)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 5990071	A	19991123	US 1998-104872	19980625
	CA 2333534	A1	19991229	CA 1999-2333534	19990609
	WO 9967446	A1	19991229	WO 1999-US12966	19990609
	W: CA, JP, KR				
	RW: AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE				
	EP 1090163	A1	20010411	EP 1999-927383	19990609
	R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
	JP 2002519507	T	20020702	JP 2000-556084	19990609
PRAI	US 1998-104872	A	19980625		
	WO 1999-US12966	W	19990609		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 5990071	ICM	C11D003-24
	ICS	C11D003-43
	INCL	510412000
	IPCI	C11D0003-24 [ICM,6]; C11D0003-43 [ICS,6]
	IPCR	C11D0007-22 [N,C*]; C11D0007-24 [N,A]; C11D0007-26 [N,A]; C11D0007-28 [N,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]
	NCL	510/412.000; 252/364.000; 510/175.000; 510/255.000; 510/256.000; 510/258.000; 510/273.000; 510/401.000
	ECLA	C11D007/50A6; C11D011/00B2D8; C23G005/028; M11D; M11D; M11D
CA 2333534	IPCI	C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6]
	IPCR	C11D0007-22 [N,C*]; C11D0007-24 [N,A]; C11D0007-26 [N,A]; C11D0007-28 [N,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]
	ECLA	C11D007/50A6; C11D011/00B2D8; C23G005/028; M11D; M11D; M11D
WO 9967446	IPCI	C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6]
	IPCR	C11D0007-22 [N,C*]; C11D0007-24 [N,A]; C11D0007-26 [N,A]; C11D0007-28 [N,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]
	ECLA	C11D007/50A6; C11D011/00B2D8; C23G005/028; M11D; M11D; M11D
EP 1090163	IPCI	C23G0005-028 [ICM,6]; C23G0005-00 [ICM,6,C*]; C11D0007-50 [ICS,6]
	IPCR	C11D0007-22 [N,C*]; C11D0007-24 [N,A]; C11D0007-26 [N,A]; C11D0007-28 [N,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]
	ECLA	C11D007/50A6; C11D011/00B2D8; C23G005/028; M11D; M11D; M11D
JP 2002519507	IPCI	C23G0005-028 [ICM,7]; C23G0005-00 [ICM,7,C*]; C11D0007-50 [ICS,7]
	IPCR	C11D0007-22 [N,C*]; C11D0007-24 [N,A]; C11D0007-26 [N,A]; C11D0007-28 [N,A]; C11D0007-50 [I,C*]; C11D0007-50 [I,A]; C11D0011-00 [I,C*]; C11D0011-00 [I,A]; C23G0005-00 [I,C*]; C23G0005-028 [I,A]

AB Ag tarnishing is inhibited when using ether-stabilized, Pr bromide-based cleaning compns. by including a small amount of  $\geq 1$  C3-8 acetylenic hydrocarbon or haloalkylhydrocarbon. Adding 4% dioxolane, and 3-butylene-2-ol to stabilized Pr bromide cleaner resulted in no tarnishing of Ag-plated steel coupons.

ST acetylenic compd tarnish inhibitor solvent cleaner; propyl bromide solvent cleaner silver; ether stabilized solvent cleaner

IT Cleaning solvents  
(acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, Pr bromide-based solvent systems)

IT Tarnishing  
(inhibiting; acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, Pr bromide-based solvent systems)

IT 106-94-5, n-Propyl bromide  
RL: TEM (Technical or engineered material use); USES (Uses)  
(solvent; acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, Pr bromide-based solvent systems)

IT 96-48-0, .gamma.-Butyrolactone 109-99-9, Tetrahydrofuran, uses 110-88-3, Trioxane, uses 123-91-1, 1,4-Dioxane, uses 646-06-0, 1,3-Dioxolane  
RL: MOA (Modifier or additive use); USES (Uses)  
(stabilizer; acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, Pr bromide-based solvent systems)

IT 106-96-7, Propargyl bromide 107-19-7, Propargyl alcohol 115-19-5, 2-Methyl-3-buten-2-ol 624-65-7, Propargyl chloride 693-02-7, 1-Hexyne 764-01-2, 2-Butyn-1-ol 927-74-2, 3-Butyn-1-ol 928-49-4, 3-Hexyne 2028-63-9, 3-Butyn-2-ol  
RL: MOA (Modifier or additive use); USES (Uses)  
(tarnish inhibitor; acetylene compound for inhibiting tarnish formation when cleaning silver with ether-stabilized, Pr bromide-based solvent systems)

RE.CNT 9 THERE ARE 9 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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- (2) Anon; JP 6119700 1986
- (3) Anon; JP 62-7798 1987 CAPLUS
- (4) Clark; US 5616549 1997 CAPLUS
- (5) Flynn; US 5814595 1998 CAPLUS
- (6) Flynn; US 5827812 1998 CAPLUS
- (7) Hartzler; US 3758503 1973 CAPLUS
- (8) Henry; US 5403507 1995 CAPLUS
- (9) Oshima; US 5492645 1996 CAPLUS

L36 ANSWER 12 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1999:734696 CAPLUS

DN 132:86245

ED Entered STN: 19 Nov 1999

TI New normal-propyl bromide based cleaning technology for the electronics industry

AU Chang, Suae-chen; Shubkin, Ronald L.

CS Albemarle Corporation, Baton Rouge, LA, USA

SO Circuit World (1999), 25(4), 17-21

CODEN: CIWODV; ISSN: 0305-6120

PB MCB University Press

DT Journal; General Review

LA English

CC 76-0 (Electric Phenomena)

AB A review with 5 refs. Precision cleaning with solvent systems based on Pr

bromide (nPB) has become an important component of the circuit board fabrication process. The nPB-based cleaners have proved themselves valuable alternatives to the once popular chlorocarbons and hydrochlorocarbons. These latter solvents have been largely banned or restricted because of toxicol. and/or environmental considerations. Pr bromide has nearly identical phys. and cleaning properties to 1,1,1-trichloroethane (1,1,1-T or TCA), but it has a low ozone depletion potential (ODP) and a low global warming potential (GWP). A growing body of evidence shows that nPB-based solvents are safe, effective, and cost-efficient alternatives for precision cleaning applications. New formulations have now been developed specifically for the electronics industry. The first challenge is the efficient removal of ionic residues left by certain types of solder flux. The second challenge is the prevention of tarnish on silver leads used on some circuit boards. Case histories and a discussion of relevant toxicol., environmental, and regulatory considerations are included.

ST review propyl bromide cleaning electronic industry

IT Cleaning

Electronics

(normal-Pr bromide based cleaning technol. for electronics industry)

IT 106-94-5, Propyl bromide

RL: NUU (Other use, unclassified); USES (Uses)

(normal-Pr bromide based cleaning technol. for electronics industry)

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

(1) Kanegsberg, B; 1996 International Conference on Ozone Protection Technologies Proceedings and Presentation 1996

(2) Kanegsberg, B; Chemistry and Industry 1996, 20, P787 CAPLUS

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L36 ANSWER 13 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1999:236323 CAPLUS

DN 131:10750

ED Entered STN: 16 Apr 1999

TI Effect of surface roughness on the self-assembly of octadecanethiol monolayer onto polycrystalline noble metal surfaces

AU Subramanian, R.; Lakshminarayanan, V.

CS Raman Research Institute, Bangalore, 560 080, India

SO Current Science (1999), 76(5), 665-669

CODEN: CUSCAM; ISSN: 0011-3891

PB Current Science Association

DT Journal

LA English

CC 72-2 (Electrochemistry)

Section cross-reference(s): 66

AB The role of surface roughness on defect formation in octadecanethiol monolayer covered surfaces of gold, silver and copper was studied using cyclic voltammetry and scanning tunneling microscopy. The adsorption of alkanethiol on surfaces subjected to various pre-treatments like mech. polishing using different grades of emery and alumina indicates that a surface polished with 0.05  $\mu\text{m}$  alumina has a significantly greater number of defect sites, thereby allowing access to redox species, compared to a surface treated with coarse emery. Scanning tunneling microscopic studies reveal that for a given area, a 'smooth' alumina polished surface has a number of closely spaced corrugations compared to a surface roughened using a coarse emery. There exists a direct correlation between surface roughness and barrier efficiency.

ST surface roughness self assembly octadecanethiol monolayer polycryst noble

metal; cyclic voltammetry octadecanethiol monolayer gold silver  
copper surface pretreatment; STM surface roughness effect octadecanethiol  
monolayer noble metal

IT Adsorbed monolayers  
Self-assembly  
(effect of surface roughness on self-assembly of octadecanethiol  
monolayer onto copper or silver or gold surfaces studied by  
cyclic voltammetry and scanning tunneling microscopy)

IT Cyclic voltammetry  
Scanning tunneling microscopy  
Surface roughness  
(effect of surface roughness on self-assembly of octadecanethiol  
monolayer onto polycryst. noble metal surfaces studied by cyclic  
voltammetry and scanning tunneling microscopy)

IT Noble metals  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(effect of surface roughness on self-assembly of octadecanethiol  
monolayer onto polycryst. noble metal surfaces studied by cyclic  
voltammetry and scanning tunneling microscopy)

IT Polishing  
(of copper or silver or gold in study of effect of surface  
roughness on self-assembly of octadecanethiol monolayer onto copper or  
silver or gold surfaces studied by cyclic voltammetry and  
scanning tunneling microscopy)

IT Adsorption  
(of octadecanethiol by copper or silver or gold surfaces and  
effect of surface roughness studied by cyclic voltammetry and scanning  
tunneling microscopy scanning tunneling microscopy)

IT 7440-22-4, Silver, uses 7440-50-8, Copper, uses 7440-57-5,  
Gold, uses  
RL: DEV (Device component use); PEP (Physical, engineering or chemical  
process); PRP (Properties); PROC (Process); USES (Uses)  
(effect of surface roughness on self-assembly of octadecanethiol  
monolayer onto copper or silver or gold surfaces studied by  
cyclic voltammetry and scanning tunneling microscopy)

IT 2885-00-9, Octadecanethiol  
RL: PEP (Physical, engineering or chemical process); PRP (Properties);  
PROC (Process)  
(effect of surface roughness on self-assembly of octadecanethiol  
monolayer onto polycryst. noble metal surfaces studied by cyclic  
voltammetry and scanning tunneling microscopy)

RE.CNT 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS RECORD

RE

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P124  
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- (24) Xu, J; J Colloid Interface Sci 1995, V176, P138 CAPLUS
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L36 ANSWER 14 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1998:269960 CAPLUS

DN 129:45750

OREF 129:9485a,9488a

ED Entered STN: 13 May 1998

TI Air Stability of Alkanethiol Self-Assembled Monolayers on Silver  
and Gold Surfaces

AU Schoenfish, Mark H.; Pemberton, Jeanne E.

CS Department of Chemistry, University of Arizona, Tucson, AZ, 85721, USA

SO Journal of the American Chemical Society (1998), 120(18), 4502-4513

CODEN: JACSAT; ISSN: 0002-7863

PB American Chemical Society

DT Journal

LA English

CC 66-4 (Surface Chemistry and Colloids)

Section cross-reference(s): 72, 73

AB Surface Raman spectroscopy, electrochem., and XPS were used to study the effects of air exposure on the stability of self-assembled monolayers (SAM) formed from alkanethiols on mech. polished, smooth Ag and Au surfaces. Raman spectra exhibited oxidized S modes after only hours of air exposure. XPS of the S 2p region provided addnl. evidence of S oxidation. Cyclic voltammetry of Ru(NH3)6<sup>3+</sup> indicated that oxidized alkanethiol SAM retain blocking characteristics toward electron transfer, even after exposure of the oxidized SAM-surface to a solubilizing solvent. Control expts. suggested O3 as the primary oxidant in ambient laboratory air which causes rapid oxidation of the thiolate moiety. Results have important ramifications for the general use of SAM in many proposed applications.

ST alkanethiol self assembled monolayer air stability; silver surface alkanethiol monolayer air stability; gold surface alkanethiol monolayer air stability; ozone oxidn alkanethiol monolayer

IT Thiols (organic), properties

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT Adsorbed monolayers

(self-assembled; laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT Oxidation

(surface; laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT 18943-33-4

RL: NUU (Other use, unclassified); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)

(laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT 108-98-5, Thiophenol, properties 1322-36-7, Dodecanethiol



2885-00-9, Octadecanethiol 79869-58-2, Propanethiol

RL: PEP (Physical, engineering or chemical process); PRP (Properties); PROC (Process)

(laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT 10028-15-6, Ozone, reactions

RL: OCU (Occurrence, unclassified); RCT (Reactant); OCCU (Occurrence);

RACT (Reactant or reagent)

(oxidant; laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

IT 7440-22-4, Silver, properties 7440-57-5, Gold, properties

RL: NUU (Other use, unclassified); PRP (Properties); USES (Uses)

(polycryst.; laboratory air exposure and alkyl chain length effect on stability of alkanethiol self-assembled monolayers on silver and gold surfaces in absence of light)

RE.CNT 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS RECORD

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L36 ANSWER 15 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1993:8126 CAPLUS

DN 118:8126

OREF 118:1671a,1674a

ED Entered STN: 10 Jan 1993

TI Curable organopolysiloxane compositions for metals and their cured products

IN Kawate, Yasutoshi; Aramata, Mikio; Noguchi, Naoya

PA Shin-Etsu Chemical Industry Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C08L083-06

ICS C08K005-37

CC 38-3 (Plastics Fabrication and Uses)

Section cross-reference(s): 55, 56

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 04253769	A	19920909	JP 1991-35408	19910205
	JP 2762172	B2	19980604		
PRAI	JP 1991-35408		19910205		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 04253769	ICM	C08L083-06
	ICS	C08K005-37
	IPCI	C08L0083-06 [ICM,5]; C08L0083-00 [ICM,5,C*]; C08K0005-37 [ICS,5]; C08K0005-00 [ICS,5,C*]
	IPCR	C08K0005-37 [I,A]; C08K0005-00 [I,C*]; C08K0005-54 [I,A]; C08K0005-5419 [I,A]; C08L0083-00 [I,C*]; C08L0083-04 [I,A]; C08L0083-06 [I,A]

AB The title compns. which effectively inhibit sulfurization of metals contain organopolysiloxanes whose both terminals are blocked with OH,  $\geq 2$  hydrolyzable group-containing organic Si compds. or their hydrolyzates, crosslinking catalysts, and organomeraptans. Thus, OH-terminated dimethylpolysiloxane (20,000 cSt) was mixed with vinyltributanoximesilane, dibutyltin dioctoate, stearyl mercaptan, dimethylpolysiloxane (100 cSt), and silica-based fillers under anhydrous condition, spread on Ag-plated plates, then cured at 20-50% relative humidity for 48 h to give sample specimens, which when left in 1% H<sub>2</sub>S-containing dry air for 14 days completely inhibit sulfurization of the surfaces of the plates.

ST curable organopolysiloxane compn organomeraptan; silicon compd organopolysiloxane compn curable; mercaptan organopolysiloxane compn curable; sulfurization metal inhibiting organopolysiloxane compn

IT Sulfurization and Sulfidization  
 (inhibition of, by organopolysiloxane compns. containing organomeraptans)

IT Tarnishing  
 (prevention of, of silver, silicone coatings for)

IT Coating materials  
 (tarnish-preventing, silicones, for silver)

IT Siloxanes and Silicones, uses  
 RL: USES (Uses)  
 (di-Me, hydroxy-terminated, vinyltributanoximesilane-crosslinked, containing organomeraptans, with sulfurization-inhibiting effects on

metals)  
 IT 2224-33-1  
 RL: MOA (Modifier or additive use); USES (Uses)  
 (crosslinking agents, for hydroxy-terminated dimethylpolysiloxanes)  
 IT 4731-77-5, Dibutyltin dioctoate  
 RL: CAT (Catalyst use); USES (Uses)  
 (crosslinking catalysts, for organopolysiloxane compns.)  
 IT 2885-00-9, Stearyl mercaptan 31494-22-1, Oleyl mercaptan  
 RL: USES (Uses)  
 (organopolysiloxane compns. containing, for inhibition of metal  
 sulfurization)  
 IT 7704-34-9  
 RL: USES (Uses)  
 (sulfurization and Sulfidization, inhibition of, by organopolysiloxane  
 compns. containing organomercaptans)  
 IT 7440-22-4, Silver, uses  
 RL: USES (Uses)  
 (tarnishing-preventing silicone coatings for)

L36 ANSWER 16 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN  
 AN 1992:536001 CAPLUS  
 DN 117:136001  
 OREF 117:23503a,23506a  
 ED Entered STN: 04 Oct 1992  
 TI Aqueous emulsion for temporary protection of silver and copper  
 surfaces against tarnishing  
 IN Grossmann, Hermann  
 PA Doduco GmbH und Co. Dr. Eugen Duerrwaechter, Germany  
 SO Eur. Pat. Appl., 6 pp.  
 CODEN: EPXXDW  
 DT Patent  
 LA German  
 IC ICM C23F011-16  
 CC 56-10 (Nonferrous Metals and Alloys)  
 FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	EP 492487	A1	19920701	EP 1991-121903	19911220
	EP 492487	B1	19960320		
	R: DE, ES, FR, GB, IT, NL				
	DE 4041596	A1	19920702	DE 1990-4041596	19901222
	ES 2086471	T3	19960701	ES 1991-121903	19911220
PRAI	DE 1990-4041596	A	19901222		
	DE 1991-4124955	A	19910727		

# CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
EP 492487	ICM	C23F011-16
	IPCI	C23F0011-16 [ICM,5]; C23F0011-10 [ICM,5,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16B
DE 4041596	IPCI	C23F0011-12 [ICM,5]; C23F0011-16 [ICS,5]; C23F0011-10 [ICS,5,C*]; C09K0015-06 [ICA,5]; C09K0015-12 [ICA,5]; C09K0015-00 [ICA,5,C*]; B01F0017-42 [ICA,5]; B01F0017-38 [ICA,5]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16B
ES 2086471	IPCI	C23F0011-16 [ICM,6]; C23F0011-10 [ICM,6,C*]
	IPCR	C23F0011-10 [I,C*]; C23F0011-16 [I,A]
	ECLA	C23F011/16B
AB		The emulsion of pH 1-10 (preferably 2-4) comprises a hydrophobic inhibitor of a C <sub>2</sub> 12 thioalc. with ≥1 SH group and its ester 0.05-50

(preferably 2-20), emulsifier 0.05-50 (2-20), and an anionic or nonionic surfactant  $\leq 2$  (0.05-1 g/L). The emulsifier comprises an alkoxyated and preferably ethoxylated branched C4-20 alc., an alkyl or alkylphenyl ether of polyethylene glycol. Ag, Cu, and their alloys are treated with the emulsion at  $>T$  (m.p. of inhibitor), rinsed with H<sub>2</sub>O at  $<T$ , and dried with hot air. An example emulsion of pH 3 and suitable for treatment of Ag and Ag alloys contains octadecanethiol 0.5-30, polyethylene glycol alkyl ether 0.5-30, and SDS  $\leq 1$  g/L H<sub>2</sub>O.

- ST tarnishing inhibitor silver copper; thiol SDS  
tarnishing inhibitor silver; SDS thiol  
tarnishing inhibitor copper; polyethylene glycol ether  
tarnishing inhibitor
- IT Thiols, uses  
RL: USES (Uses)  
(corrosion inhibitors, for copper and silver, with  
emulsifiers of alkyl or alkylphenyl ether of polyethylene glycol)
- IT Tarnishing  
(of silver and copper alloys, aqueous emulsion for prevention of)
- IT Corrosion inhibitors  
(thiols, with emulsifiers of alkyl or alkyl Ph ether of polyethylene glycol)
- IT Alcohols, compounds  
RL: PROC (Process)  
(C8-16, ethoxylated, corrosion inhibitor emulsion containing, thiol, for  
copper and silver and their alloys)
- IT copper alloy, base  
silver alloy, base  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(tarnishing of, thiol inhibitor for)
- IT 25322-68-3D, Polyethylene glycol, alkyl and alkylphenyl ethers 151-21-3,  
uses  
RL: PROC (Process)  
(corrosion inhibitor emulsion containing, thiol, for copper and  
silver and their alloys)
- IT 2885-00-9, Octadecanethiol  
RL: PROC (Process)  
(corrosion inhibitors, for copper and silver, with  
emulsifiers of alkyl or alkylphenyl ether of polyethylene glycol)
- IT 7440-22-4, Silver, reactions 7440-50-8, Copper, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(tarnishing of, thiol inhibitor for)

L36 ANSWER 17 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1991:607232 CAPLUS

DN 115:207232

OREF 115:35345a,35348a

ED Entered STN: 15 Nov 1991

TI Surface Raman scattering of self-assembled monolayers formed from  
1-alkanethiols: behavior of films at gold and comparison to films at  
silver

AU Bryant, Mark A.; Pemberton, Jeanne E.

CS Dep. Chem., Univ. Arizona, Tucson, AZ, 85721, USA

SO Journal of the American Chemical Society (1991), 113(22), 8284-93

CODEN: JACSAT; ISSN: 0002-7863

DT Journal

LA English

CC 22-3 (Physical Organic Chemistry)

AB Surface Raman scattering is used to study self-assembled monolayers formed  
from a series of Me(CH<sub>2</sub>)<sub>n</sub>SH (I; n = 3-5, 7, 8, 11, 17) at mech.  
polished and electrochem. roughened Au surfaces. Defect structure  
in these films is examined by use of the relative intensities of peaks due

to trans and gauche conformations in the  $\nu(\text{C-S})$  and  $\nu(\text{C-C})$  frequency regions. Surface selection rules for Raman spectroscopy are used to estimate orientation of the I layers at Au. The orientation proposed on the basis of the Raman spectral data is consistent with those previously reported on the basis of other measurements at Au surfaces. This orientation is compared to that previously determined for these films at Ag, which have a chain tilt from the surface normal less than the  $30^\circ$  previously reported for Au. The C-S bond is perpendicular to the Ag surface, but largely parallel to the surface at Au. Differences in the spectra of short-chain I from smooth and rough surfaces are attributed to disordering of the film at the roughened Au surface, which occurs predominantly near the S end of the mol. on rough Au surfaces.

- ST gold surface Raman selfassembled alkanethiol monolayer; silver surface Raman selfassembled alkanethiol film
- IT Raman spectra  
(of alkanethiols in self-assembled monolayers at roughened or smooth gold surfaces)
- IT Molecular association  
Molecular orientation  
(of alkanethiols on roughened or smooth gold surfaces)
- IT Molecular vibration  
(of alkanethiols, effect of self-assembled monolayers formed on roughened or smooth gold surfaces on)
- IT Conformation and Conformers  
(of alkenethiols in self-assembled monolayers on roughened or smooth gold surfaces)
- IT Films  
(self-assembled monolayer, of alkanethiols on roughened or smooth gold surfaces)
- IT Thiols, properties  
RL: PRP (Properties)  
(surface self-assembled monolayers of, on roughened or smooth gold surfaces, Raman spectra in relation to conformation and orientation in)
- IT 7440-57-5P, Gold, preparation  
RL: PREP (Preparation)  
(self-assembled monolayers of alkanethiols on)
- IT 109-79-5, Butanethiol 110-66-7, Pentanethiol 111-31-9, Hexanethiol 111-88-6, 1-Octanethiol 112-55-0, 1-Dodecanethiol 1455-21-6, Nonanethiol 2885-00-9, 1-Octadecanethiol  
RL: PRP (Properties)  
(self-assembled monolayers of, on gold surfaces, Raman spectra of)
- L36 ANSWER 18 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN
- AN 1991:216967 CAPLUS
- DN 114:216967
- OREF 114:36393a,36396a
- ED Entered STN: 31 May 1991
- TI Surface Raman scattering of self-assembled monolayers formed from 1-alkanethiols at silver [electrodes]
- AU Bryant, Mark A.; Pemberton, Jeanne E.
- CS Dep. Chem., Univ. Arizona, Tucson, AZ, 85721, USA
- SO Journal of the American Chemical Society (1991), 113(10), 3629-37
- CODEN: JACSAT; ISSN: 0002-7863
- DT Journal
- LA English
- CC 73-3 (Optical, Electron, and Mass Spectroscopy and Other Related Properties)
- AB Surface Raman scattering is used to study self-assembled monolayers formed from a series of 1-alkanethiols (1-butanethiol, 1-dodecanethiol, 1-octadecanethiol) at both electrochem. roughened and mech. polished polycryst. Ag electrodes. The spectra obtained

at both surfaces are similar in all spectral regions. Defect structure in these films is investigated using the relative amts. of trans and gauche conformers in the  $\nu(\text{C-S})$  and  $\nu(\text{C-C})$  frequency regions. These monolayer films are most ordered in the cases of 1-butanethiol and 1-octadecanethiol and least ordered in the case of 1-dodecanethiol. This behavior correlates with the ordering observed in the bulk 1-alkanethiols. Surface selection rules are used to determine mol. orientation at Ag.

ST surface Raman alkanethiol silver electrode; thiol alkane surface Raman silver electrode; butanethiol monolayer silver surface Raman; dodecanethiol monolayer silver surface Raman; octadecanethiol monolayer silver surface Raman

IT Surface  
(Raman scattering of alkanethiols at silver electrode)

IT Electrodes  
(silver, surface Raman scattering of self-assembled monolayers formed from alkanethiols at)

IT Thiols, properties  
RL: PRP (Properties)  
(surface Raman scattering of self-assembled monolayers formed from, at silver electrodes)

IT Raman spectra  
(surface scattering of self-assembled monolayers formed from alkanethiols at silver electrodes)

IT 7440-22-4, Silver, properties  
RL: PRP (Properties)  
(surface Raman scattering of self-assembled monolayers formed from alkane thiols at electrodes of)

IT 109-79-5, 1-Butanethiol 112-55-0, 1-Dodecanethiol 2885-00-9, 1-Octadecanethiol  
RL: PRP (Properties)  
(surface Raman scattering of self-assembled monolayers formed from, at silver electrodes)

L36 ANSWER 19 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1991:86953 CAPLUS

DN 114:86953

OREF 114:14759a,14762a

ED Entered STN: 09 Mar 1991

TI Protection of silver parts from tarnishing

PA Blasberg-Oberflaeche-technik G.m.b.H., Germany

SO Ger. Offen., 3 pp.

CODEN: GWXXBX

DT Patent

LA German

IC ICM C23C0022-03

ICS H01R043-00

ICA H01R013-629

CC 56-6 (Nonferrous Metals and Alloys)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 3905850	A1	19900830	DE 1989-3905850	19890224
PRAI	DE 1989-3905850		19890224		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 3905850	ICM	C23C0022-03
	ICS	H01R043-00
	ICA	H01R013-629
	IPCI	C23C0022-03 [ICM,5]; C23C0022-02 [ICM,5,C*]; H01R0043-00 [ICS,5]; H01R0013-629 [ICA,5]

IPCR C23F0011-10 [I,C\*]; C23F0011-16 [I,A]  
 ECLA C23F011/16B

AB The parts (e.g. elec. contacts) are treated with a solution of a long-chain mercapto compound (stearyl mercaptan, cetyl mercaptan) in C4-5 glycol and/or glycol ether (1-methoxy-2-propanol, Bu glycol, and/or methoxybutanol) with or without subsequent rinsing with solvent, water, or warm aqueous detergent. Successful protection of Ag parts in H<sub>2</sub>S atmospheric by treatment with the invention solution was demonstrated.

ST silver protection stearyl mercaptan; cetyl mercaptan  
 silver protection; hydrogen sulfide silver protection  
 mercaptan

IT Electric contacts  
 (silver tarnishing of, in hydrogen sulfide atmospheric,  
 treatment with cetyl or stearyl mercaptan for prevention of)

IT 7783-06-4, Hydrogen sulfide, uses and miscellaneous  
 RL: USES (Uses)  
 (tarnishing by, of silver, in sulfide atmospheric,  
 treatment with cetyl or stearyl mercaptan for prevention of)

IT 7440-22-4, Silver, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (tarnishing of, in hydrogen sulfide atmospheric, treatment with  
 cetyl or stearyl mercaptan for prevention of)

IT 2885-00-9, Stearyl mercaptan 2917-26-2, Cetyl mercaptan  
 RL: USES (Uses)  
 (treatment with glycol or glycol ether of, of silver, for  
 tarnishing prevention)

L36 ANSWER 20 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1985:118206 CAPLUS

DN 102:118206

OREF 102:18526h,18527a

ED Entered STN: 06 Apr 1985

TI Tarnish inhibitors for gold and silver

PA Alps Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

IC ICM C23F011-16

ICS C23F011-12

CC 56-10 (Nonferrous Metals and Alloys)

Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 59215490	A	19841205	JP 1983-89183	19830523
	JP 61055596	B	19861128		
PRAI	JP 1983-89183		19830523		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 59215490	ICM	C23F011-16
	ICS	C23F011-12
	IPCI	C23F0011-16 [ICM,3]; C23F0011-12 [ICS,3]; C23F0011-10 [ICS,3,C*]
	IPCR	C23F0011-00 [I,C*]; C23F0011-00 [I,A]; C23F0011-10 [I,C*]; C23F0011-10 [I,A]

AB The inhibitors contain linear alkyl mercaptan, poly(oxyethylene) nonylphenol ether, and iso-Pr alc. The inhibitors prevent discoloration of Au, Ag, or their alloys, and do not increase the elec. resistance. Thus, a phosphor bronze sheet coated with Ag 3μ thick was treated with a tarnish inhibitor composed of

n-hexadecyl mercaptan [2917-26-2] 2 + 10-4,  
poly(oxyethylene) nonylphenol ether [9016-45-9] (ethylene oxide 9 mol%)  
0.07, iso-Pr alc. 5%, and balance water. The sheet exposed in an atmospheric

at 20° containing H2S 0.05 ppm showed no change in the surface condition,  
with decreased discoloration and elec. contact resistance.  
ST gold silver tarnishing inhibitor; hexadecyl mercaptan  
tarnish inhibitor; tetradecyl mercaptan tarnish  
inhibitor; polyoxyethylene nonylphenol ether tarnish inhibitor;  
isopropanol tarnish inhibitor silver  
IT Tarnishing  
(inhibitors, for gold and silver)  
IT Corrosion inhibitors  
(tarnishing, for gold and silver)  
IT 2079-95-0 2917-26-2 9016-45-9  
RL: USES (Uses)  
(in tarnish inhibitor, for gold and silver)  
IT 7440-02-0, uses and miscellaneous  
RL: USES (Uses)  
(tarnish inhibitor for gold on brass plated with)  
IT 12597-71-6, uses and miscellaneous  
RL: USES (Uses)  
(tarnish inhibitor for gold- or silver-plated)  
IT 12767-50-9  
RL: USES (Uses)  
(tarnish inhibitor for silver-plated)  
IT 7440-22-4, uses and miscellaneous  
RL: USES (Uses)  
(tarnish inhibitors for)  
IT 7440-57-5, uses and miscellaneous  
RL: USES (Uses)  
(tarnishing inhibitors for)

L36 ANSWER 21 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN  
AN 1978:157165 CAPLUS  
DN 88:157165  
OREF 88:24723a,24726a  
ED Entered STN: 12 May 1984  
TI Prevention of tarnishing on silver or its alloy  
products  
IN Kawana, Yasuo; Ara, Takeo  
PA Alps Electric Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 6 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
IC C23F007-00  
CC 56-5 (Nonferrous Metals and Alloys)  
Section cross-reference(s): 76

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 52111430	A	19770919	JP 1976-27793	19760315
	JP 56001396	B	19810113		
PRAI	JP 1976-27793	A	19760315		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
JP 52111430	IC	C23F007-00
	IPCI	C23F0007-00; C23F0011-12; C23F0011-16; C23F0011-10 [C*]
	IPCR	C23C0022-05 [I,C*]; C23C0022-60 [I,A]; C23F0011-00 [I,C*]; C23F0011-00 [I,A]; C23F0011-10 [I,C*];



C23F0011-12 [I,A]; C23F0011-16 [I,A]; H01H0001-00  
[I,C\*]; H01H0001-00 [I,A]

AB A mixture containing mercapto compound, alkaline compound, alc., and organotin  
laurate,

e.g., Bu<sub>2</sub>Sn dilaurate, is used to prevent tarnish on Ag  
, and stabilizes elec. contact resistance. Thus, the mixture contained  
lauryl mercaptan [112-55-0] 2.0, cetyl mercaptan [2917-26-2]  
0.5, 2-naphthalenethiol [91-60-1] 0.1, benzotriazole [95-14-7] 0.1,  
dioctyltin dilaurate [3648-18-8] 1.0, polyoxyethylene alkyl ether 1.0,  
polyoxyethylene alkyl ester 1.0, 28% NH<sub>4</sub>OH solution 20, EtOH 10, and water  
64.3%. The tarnish rating of Ag with the coating was  
.apprx.1 after exposing 60 h to a H<sub>2</sub>S-NH<sub>3</sub> atmospheric vs. .apprx.10 after  
treatment 25 h with a com. mixture

ST silver tarnish preventing mixt; elec contact  
silver tarnish prevention

IT Coating materials

(Coating materials for tarnish prevention of silver)

IT Tarnishing

(of silver, coating for prevention of)

IT 91-60-1 95-14-7 112-55-0 2917-26-2 3648-18-8

RL: USES (Uses)

(in tarnish-preventing coating for silver)

IT 7440-22-4, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(tarnishing of, coatings for prevention of)

L36 ANSWER 22 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1970:405261 CAPLUS

DN 73:5261

OREF 73:899a,902a

ED Entered STN: 12 May 1984

TI Liquid silver polishing agents

IN Thornton, James C.; Nixon, C. P.; Cox, Bernard C.

PA Goddard, J., and Sons Ltd.

SO Ger. Offen., 13 pp.

CODEN: GWXXBX

DT Patent

LA German

IC C11D007-34

CC 46 (Surface Active Agents and Detergents)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	DE 1932524	A	19700416	DE 1969-1932524	19690626
	GB 1217414	A	19701231	GB 1968-31214	19680629
	BE 734968	A	19691201	BE 1969-734968	19690623
	NL 6909896	A	19691231	NL 1969-9896	19690627
	FR 2011801	A5	19700306	FR 1969-22017	19690630
PRAI	GB 1968-31214	A	19680629		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 1932524	IC	C11D007-34
	IPCI	C11D0007-34; C11D0007-22 [C*]
	IPCR	C11D0007-02 [I,C*]; C11D0007-08 [I,A]; C11D0007-22 [I,C*]; C11D0007-34 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]; C23G0001-02 [I,C*]; C23G0001-10 [I,A]
GB 1217414	IPCI	C11D0007-34; C11D0007-22 [C*]
	IPCR	C11D0007-02 [I,C*]; C11D0007-08 [I,A]; C11D0007-22 [I,C*]; C11D0007-34 [I,A]; C23G0001-02 [I,C*]; C23G0001-10 [I,A]

BE 734968 ECLA C23F011/16B; C11D007/08; C11D007/34; C23G001/10  
 IPCI C11D0007-34; C11D0007-22 [C\*]  
 NL 6909896 IPCI C11D0007-34 [ICM]; C11D0007-22 [ICM,C\*]; C23G0001-02 [ICS]  
 IPCR C11D0007-02 [I,C\*]; C11D0007-08 [I,A]; C11D0007-22 [I,C\*]; C11D0007-34 [I,A]; C23F0011-10 [I,C\*]; C23F0011-16 [I,A]; C23G0001-02 [I,C\*]; C23G0001-10 [I,A]  
 FR 2011801 ECLA C23F011/16B; C11D007/08; C11D007/34; C23G001/10  
 IPCI C23G0001-00 [ICM]  
 IPCR C11D0007-02 [I,C\*]; C11D0007-08 [I,A]; C11D0007-22 [I,C\*]; C11D0007-34 [I,A]; C23F0011-10 [I,C\*]; C23F0011-16 [I,A]; C23G0001-02 [I,C\*]; C23G0001-10 [I,A]  
 ECLA C23F011/16B; C11D007/08; C11D007/34; C23G001/10  
 AB Liquid Ag-polishing agents with tarnish-resistant activities are described. They contain an acid stronger than H<sub>2</sub>S, at least 1% CS(NH<sub>2</sub>)<sub>2</sub> or H<sub>2</sub>NCSNHNH<sub>2</sub>, forming a soluble Ag complex, 0.5-2% SH-containing compound, e.g. n-C16H31SH, n-C18H37SH, or stearyl or cetyl thioglycolate, forming a transparent, colorless protective layer on Ag surfaces, and an emulsifier. Thus, a solution contained H<sub>2</sub>NCSNH<sub>2</sub> 4.9%, H<sub>2</sub>SO<sub>4</sub> (d. 1.84) 0.81%, HCl (d. 1.16) 0.38%, ethoxylated aliphatic C12-18 amine 0.83%, stearyl mercaptan 0.88%, Solvay Blue PFN 125 0.01%, PrOH 0.011%, rest H<sub>2</sub>O. The Ag objects were cleaned by immersion in an Al basket in the above solution with formation of a galvanic cell.  
 ST silver polishing tarnishproofing; polishing  
 silver tarnishproofing; tarnishproofing silver polish  
 IT 62-56-6, uses and miscellaneous 2885-00-9  
 RL: USES (Uses)  
 (polishing materials containing, for silver)  
 IT 7440-22-4, uses and miscellaneous  
 RL: USES (Uses)  
 (polishing materials for, sulfur compound-containing)

L36 ANSWER 23 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1969:39127 CAPLUS

DN 70:39127

OREF 70:7349a,7352a

ED Entered STN: 12 May 1984

TI Silver polish containing thio compounds

IN Schlegel, Hans; Straub, Ewald; Bauer, Martin

PA Wuerttembergische Metallwarenfabrik

SO Ger., 2 pp.

CODEN: GWXXAW

DT Patent

LA German

IC C23F; C23G

CC 46 (Surface Active Agents and Detergents)

FAN.CNT 1

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI DE 1282414	B	19681107	DE 1963-W35841	19631218
PRAI DE 1963-W35841	A	19631218		

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
DE 1282414	IC	C23F; C23G
	IPCR	C11D0007-22 [I,C*]; C11D0007-34 [I,A]; C23F0003-00 [I,C*]; C23F0003-04 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]

AB Ag articles can be passivated by immersion or spraying with organic solvents containing  $\leq 50\%$  alkyl thioglycolates having 8 C atoms or by polishing with polishers containing 0.5-10% alkyl thioglycolates. The polisher can be prepared from kieselguhr 5, siliceous chalk 3, Me cellulose 1, and n-hexadecyl thioglycolate 1 kg./50 l. distilled H<sub>2</sub>O.

ST silver polish thio compd; thio compd Ag polish

IT Polishing materials  
(alkyl mercaptoacetate-containing, for silver)

IT 7440-22-4, uses and miscellaneous

RL: USES (Uses)

(polishing material for, alkyl mercaptoacetate-containing)

IT 22811-02-5

RL: USES (Uses)

(polishing materials containing, for silver)

L36 ANSWER 24 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1967:484494 CAPLUS

DN 67:84494

OREF 67:15951a,15954a

ED Entered STN: 12 May 1984

TI Metal cleaning

IN Kroll, Harry; Therrien, Alderic R., Jr.; Bennett, Phyllis W.

PA Phillip A. Hunt Chemical Corp.

SO U.S., 3 pp.

CODEN: USXXAM

DT Patent

LA English

INCL 106003000

CC 56 (Nonferrous Metals and Alloys)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	US 3330672	-----	19670711	US 1964-378993	19640629

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
US 3330672	INCL	106003000
	IPCR	C23F0011-10 [I,C*]; C23F0011-10 [I,A]; C23G0001-00 [I,C*]; C23G0001-00 [I,A]
	NCL	106/003.000; 106/008.000; 106/014.130; 106/014.150; 106/014.210; 106/014.420; 106/014.430; 106/014.440; 148/271.000; 252/390.000; 252/395.000

AB Ag and metals chemical similar to Ag are treated with a composition that removes tarnish, cleanses the metal surface, protects the Ag against further tarnish, and imparts a high surface lustre. The active ingredients of the composition are 0.1-10.0 parts of mercapto esters and 0.1-10.0 parts of amine salts. The structure of the mercapto esters is: HS(CH<sub>2</sub>)<sub>n</sub>CO<sub>2</sub>R where n is 1 or 2 and R is alkyl of 12-18 C. The structure of the amine salts is: [R<sub>1</sub>R<sub>2</sub>R<sub>3</sub>N+H]X<sup>-</sup> where R<sub>1</sub> is alkyl of 8-20 C and R<sub>2</sub> and R<sub>3</sub> are H, Me, and Et, and X is the anion derived from a low mol. weight, aqueous soluble organic acid as acetic, formic, citric, malic, maleic, fumaric, etc. A polishing abrasive may be added to the composition in 0.1-10.0 parts. The active ingredients may be used with a liquid carrier or a finely divided solid abrasive carrier. The liquid carrier may be water, iso-PrOH, or chlorinated hydrocarbon. The abrasive carrier may be pumice, rouge, diatomaceous earth, CaCO<sub>3</sub>, or any usual polishing abrasive.

ST CLEANING COMPN AG; SILVER CLEANING COMPN

IT Tallow

RL: PRP (Properties)  
(amines from, acetates, compns. containing, for tarnish removal  
from silver)

IT Tarnish  
(removal of, from silver, compns. for)

IT Metals, uses and miscellaneous

RL: USES (Uses)

(tarnish removal from, compns. for)

IT 2190-04-7 3746-39-2 10220-46-9 17369-34-5 17369-37-8

RL: USES (Uses)

(compns. containing, for tarnish removal from silver)

IT 7440-22-4P, uses and miscellaneous

RL: PREP (Preparation); USES (Uses)

(tarnish removal from, compns. for)

L36 ANSWER 25 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN

AN 1967:465804 CAPLUS

DN 67:65804

OREF 67:12443a,12446a

ED Entered STN: 12 May 1984

TI Metal cleaning, polishing or protecting preparations

IN Ford, Ian A. M.; Cox, Bernard C.; Thornton, James C.

PA Goddard, J., and Sons Ltd.

SO Brit., 3 pp.

CODEN: BRXXAA

DT Patent

LA English

IC C23G

CC 46 (Surface Active Agents and Detergents)

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	GB 1070383		19670601	GB 1963-25235	19630625
	DE 1519159			DE	
	US 3518098		19700630	US	19640623

CLASS

PATENT NO.	CLASS	PATENT FAMILY CLASSIFICATION CODES
GB 1070383	IC	C23G
	IPCI	C23G
	IPCR	C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-34 [I,C*]; C11D0003-34 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]; C23G0001-02 [I,C*]; C23G0001-10 [I,A]
US 3518098	IPCR	C09G0001-00 [I,C*]; C09G0001-02 [I,A]; C11D0003-34 [I,C*]; C11D0003-34 [I,A]; C23F0011-10 [I,C*]; C23F0011-16 [I,A]; C23G0001-02 [I,C*]; C23G0001-10 [I,A]
	NCL	106/003.000; 106/008.000; 106/014.130; 148/271.000; 252/395.000

AB A cleaning, polishing, or protective preparation is provided for metal surfaces containing Ag, Cu, or Ni. The preparation may be a solid, liquid, paste, powder, or semi-solid, or it may be in the form of a surface-treating compound mixed with a protective medium consisting preferably of esters derived from thioglycolic or mercaptopropionic acid and a C12-22 aliphatic alc. Thus a suitable preparation consists of polishing powder 20, detergent paste 40, stearyl mercaptopropionate 2.5, H3PO4 0.2, and H2O up to 100. The paste is prepared by warming the mercaptopropionate with an equal weight of detergent paste and the resulting liquid added to the dry ingredients with stirring to form a stiff paste. Afterward, the liquid content is added slowly while stirring.

ST METAL CLEANER COATING POLISH; NICKEL CLEANER POLISH;  
COPPER CLEANER POLISH; SILVER CLEANER POLISH  
; CLEANER METAL; POLISH METAL; COATING METAL

IT Metals, uses and miscellaneous  
RL: USES (Uses)  
(detergents and polishing materials containing octadecyl  
mercaptopropionate or thioglycollate for)

IT Detergents, preparation  
Polishing materials  
(octadecyl mercaptopropionate or octadecyl thioglycollate-containing, for  
metals)

IT 7440-02-0, uses and miscellaneous 7440-22-4, uses and miscellaneous  
7440-50-8, uses and miscellaneous  
RL: USES (Uses)  
(detergents and polishing materials containing octadecyl  
mercaptopropionate or thioglycollate for)

IT 10220-46-9 28986-42-7  
RL: USES (Uses)  
(detergents and polishing materials containing, for metals)

L36 ANSWER 26 OF 26 CAPLUS COPYRIGHT 2009 ACS on STN  
AN 1964:485188 CAPLUS  
DN 61:85188  
OREF 61:14899c-d  
ED Entered STN: 22 Apr 2001  
TI Antitarnish silver polish  
AU Glickman, Charles S.  
SO Manufacturing Chemist (1930-1963) (1964), 35(9), 57,59  
CODEN: MACSAS; ISSN: 0368-8313  
DT Journal  
LA Unavailable  
CC 52 (Coatings, Inks, and Related Products)  
AB The use of octadecyl thioglycolate (I) as the main ingredient in the  
formulation of satisfactory antitarnish silver polishes  
is discussed; its alkane portion is H2O-insol. and forms a solid film,  
whereas its SH group is active enough to give a suitable resistance to  
tarnishing. I (25% by weight in iso-PrOH) can be used as a  
concentrate containing diatomaceous earth (mixed with Me cellulose or  
bentonite as a suspending agent), a surfactant, and pine oil.

IT Polishing materials  
(from octadecyl thioglycolate, Ag antitarnishing)

IT Tarnishing  
(of silver in Br-KBr solns., prevention of, octadecyl  
thioglycolate polishes for)

IT Acetic acid, mercapto-, octadecyl ester  
(tarnishing-inhibiting silver polishes  
from)

IT 10220-46-9  
(Derived from data in the 7th Collective Formula Index (1962-1966))

IT 7440-22-4, Silver  
(tarnish-inhibiting polishes for, from octadecyl  
thioglycolate)

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COST IN U.S. DOLLARS

SINCE FILE

TOTAL

ENTRY

SESSION

FULL ESTIMATED COST

112.28

262.55

DISCOUNT AMOUNTS (FOR QUALIFYING ACCOUNTS)

SINCE FILE

TOTAL

ENTRY

SESSION

CA SUBSCRIBER PRICE

-21.32

-30.34

STN INTERNATIONAL LOGOFF AT 14:31:42 ON 21 MAY 2009